

THE EFFECTS OF MODE VIVIDNESS IN  
MOBILE ADVERTISING WHEN PRESENTED IN  
THE CONTEXT OF CONSUMER GOALS AND  
PRODUCT INVOLVEMENT

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A thesis submitted in partial fulfilment of the requirements for the

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at the University of Canterbury

by

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University of Canterbury

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## **ABSTRACT**

Abstract of a thesis submitted in partial fulfilment of the requirements for the Degree of Doctor of Philosophy in Marketing

# **The Effect of Mode Vividness in Mobile Advertising When Presented in the Context of Consumer Goals and Product Involvement**

by Allen Lim

The two primary objectives for this thesis are (1) to understand the effectiveness of different types of mobile phone based advertisements and (2) to identify if the amount of time users spent viewing an advertisement can be used as a measure of advertising effectiveness. To achieve these objectives, this study first conducted qualitative studies consisting of a focus group with consumers and an interview with a mobile advertising technology provider. Qualitative study results identified the following variables of interest; vividness of the advertisement, product involvement, and consumer goals. Supported by existing literature on advertising, these variables were then used to develop a conceptual model outlining the relationship between the variables and measures of advertising effectiveness.

To empirically examine this model, this study conducted a 3x2x4 experiment of *high*, *medium* and *low* advertisement mode vividness, *high* and *low* product involvement and four stages of pre-purchase consumer goals. A total of 288 responses were collected from a student sample from the University of Canterbury, New Zealand. The dependence relationships outlined in the conceptual model were then analysed using ANCOVA, logistic regression, linear regression, and various other non-parametric analysis techniques.

The results of this study suggest that level of advertisement mode vividness and product involvement both exert a strong influence on the effectiveness of the advertisement. However, results on consumer goals suggest that the effectiveness of the advertisement is only affected by whether a consumer goal existed before viewing the advertisement. This study was unable to identify any relationship between the effectiveness of an advertisement and the amount of time users spent viewing an advertisement on a mobile phone.

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## Chapter One: **THESIS OVERVIEW**

### **1.1 INTRODUCTION**

The introduction of mobile phones has changed the way people communicate. The mobile phone is a personal device that allows individual users to be constantly connected to the rest of the world. Its popularity is unprecedented, surpassing 4.6 billion users worldwide by the end of 2009 (ITU Corporate Annual Report, 2009). Recent mobile technology development has equipped mobile phones with internet capabilities, a powerful central processing unit (CPU), a graphics processing unit (GPU), digital cameras, a global positioning system (GPS) and more. These technological advancements open up opportunities for creating a sophisticated computer mediated environment (CME) on mobile phones where gaming consoles, internet browsers, social networking tools and other technologies can now be incorporated onto these devices.

All these factors make advertising on mobile phones an exciting opportunity. Advancements in mobile technology also allow highly vivid advertisements to be delivered to users through these personal devices. While researchers have investigated the effects of text-based advertising on mobile phones and the importance of vividness in advertising, little is known about the effect of highly vivid advertisements on consumers when delivered on a mobile phone. This study was undertaken to provide a better understanding of how consumers will react to mobile phone advertisements in line with the advancement of the technology.

### **1.2 BACKGROUND STUDY**

Advertising spend on mobile phones has increased from \$743 million USD in 2010 to over \$1.2 billion USD by the end of 2011 and it is expected to reach \$4.4 billion USD by 2015 (eMarketer, 2011). This growth in mobile advertising spending has been encouraged by the rapid growth of smartphones and mobile Internet usage through mobile web and in-apps advertising (eMarketer, 2011). While the enthusiasm for mobile advertising is clear, it is unfortunately not matched by an understanding of advertising in this area. The continuous advancement in technology means that existing literature on mobile phone advertising that primarily focused on text based advertising

are outdated. To date, no literature was found on rich media advertising for mobile phones. This leads to much confusion in the industry on how to effectively utilise this new generation of mobile advertising.

The aim of this study is to better understand mobile phone advertising on devices with advanced technological specifications. This study approaches this task from a practical perspective by first evaluating what advertisers intend to achieve through advertising and consumers' perceived value for receiving and viewing advertisements on their mobile phones. To achieve this aim, this study adopted both qualitative and quantitative methods. In the qualitative phase, an interview with a technology provider for mobile phone advertising and a focus group study of consumers were conducted. The quantitative phase of the study was then developed by building upon key results from the qualitative phase while drawing upon existing literature for guidance. Three variables of interest that would affect the effectiveness of mobile advertising were identified and backed up by literature on advertising in general. These variables were (1) the mode vividness of the advertisement, (2) the type of product being advertised, and (3) consumer goals.

Technological advancement in mobile phones means that highly vivid new media advertisements can now be delivered to consumers via their mobile phones. Advertising in this intensely personal and dimensionally small device makes mobile advertising different from other forms of new media advertising such as television and the Internet on desktop or laptop computers. Vividness of the advertisement is important for two reasons. From the standpoint of advertisers, mode vividness is a construct that can be manipulated through creative advertising design, while researchers have shown that vividness plays an important role in attitude formation (Andreoli & Worchel, 1978; Chaiken & Eagly, 1976; Kisieliuss & Sternthal, 1984; Nisbett & Ross, 1980).

In addition to vividness, this thesis will also look at product involvement. Product involvement is well recognised as an important construct in advertising. It has been shown, through consumer product evaluation, that the effectiveness of advertisements is greatly influenced by the type of product advertised (Deighton 1997; Klein 1998; Smith 1993; Smith & Swinyard 1982; Wright & Lynch 1995). It is essential to understand the

interaction between vividness of the advertisement and the nature of the product that is advertised, as the knowledge obtained may allow advertisers to decide the most effective means of advertising the type of product on mobile phones and provide consumers with the most relevant information.

Research on traditional advertising media has shown that consumer behaviour is mostly goal orientated (Bagozzi & Dholakia, 1999). According to Stewart and Pavlou (2002), the key to understanding any interaction is to understand the person's goal. Retrieval and use of information from an advertisement, development of attitude, and purchase choice behaviour have also been shown to be influenced by a consumer's goal (Bettman, 1979). From the perspective of an advertiser, understanding the interaction between consumer goals and the vividness of the advertisement may allow them to design their advertising campaign by effectively targeting different groups of consumers at different stages of their overall advertising campaign.

In advertising research, consumer purchase intention is often used to measure the effectiveness of advertisements. However, the industry, especially in new media advertising, uses the number of users who viewed the advertisement (also known as *reach*) as the standard measure for advertising success (Mobile Marketing Association, 2009). The "text-book" definition of the purpose of advertising is to inform, remind and persuade (Kotler & Armstrong, 2008). While most researchers look to persuasion through the measure of purchase intention in determining success (Johnson, 1979), this approach neglects the other two core purpose for advertising of informing and reminding. This thesis will attempt to address this issue by putting more focus on the first two goals in determining the effectiveness of advertising on mobile phones.

### **1.3 RESEARCH AIMS**

This research was conducted to achieve three main objectives:

1. To gain a greater general understanding of advertising on future generation mobile phones such as smartphones.



2. To determine how the manipulation of three variables, (1) delivery mode vividness of the advertisement, (2) product involvement, and (3) pre-purchase consumer goals, impact upon consumer attitudes towards the effectiveness of advertisement on mobile phones.
3. To investigate potential use of indirect measures for the effectiveness of mobile phone advertisement through measuring the amount of time users spent viewing an advertisement.

## **1.4 THESIS OUTLINE**

This thesis is divided into seven chapters that can be briefly outlined as follows:

- Chapter One provides an overview of this study by detailing the background study and the research aims.
- Chapter Two provides the main literature review for this study, focusing on the computer mediated environment (CME), product involvement, consumer behaviour, consumer goals, effects of vividness, and effects of novelty.
- Chapter Three presents the methodologies, results and discussions for the focus group and interview conducted in this study. This chapter serves as the exploratory study that will shape the research framework in Chapter Four.
- Chapter Four presents the conceptual model that will be examined in this study. Literature relevant to the model will be discussed alongside the hypotheses that will be proposed.
- Chapter Five discusses the research methodology adopted in this study. The chapter describes the selection of sample, the experimental design, the variables used in questionnaires and the experimental procedures employed for data collection.

- Chapter Six presents the results for this study through statistical analyses of data collected where hypotheses presented in Chapter Four are be tested.
- Chapter Seven first discusses the major findings of this research followed by the theoretical and managerial implications and the limitations of this research. Future research directions are proposed to conclude the thesis.

## Chapter Two: **LITERATURE REVIEW**

### **2.1 INTRODUCTION**

This thesis covers a research topic that is unique. It is a study between two realms; technology and advertising.

This chapter provides an introduction to the relevant literature citing previous research intended for audiences of both advertising background and technology background. Attention was placed in defining relevant terms and understanding literature relevant to the context of this study.

The chapter is divided into six sections, starting with broad introductions to 1) advertising and 2) computer mediated environments (CME), specifically using mobile devices and advertising on mobile devices. The next four sections will then lay out the relevant variables of interest from a consumer behaviour perspective - 3) product involvement, 4) consumer purchase decision process, 5) mode vividness, and 6) novelty effect.

### **2.2 ADVERTISING**

Advertising delivers information (such as product, brand, and new product awareness), to remind (by exposure repetition in unique and non unique forms) and to persuade (by providing pleasant impressions and generating sales) (Kotler & Armstrong, 2008). Companies, government bodies, social services, and non-profit organisations spend millions of dollars each year to attract attention and to get their message across to the general public. Achieving these goals can be a mammoth task considering that every company or organisation is trying to achieve the same objectives within the same cluttered advertising space. Most organisations outsource their advertising needs to specialist advertising companies; while others dedicate a whole department to manage their advertising needs. The standard media in which advertising messages get delivered are through television, cinema, radio, magazines, newspapers, video games, the Internet, and billboards. However, any surface that can be covered with an advertisement, for instance, the side of a car, shopping carts, t-shirts, rubbish bins, right

down to the back of a person's head has been used as an advertising medium in the effort to break through the clutter of advertising space.

Advertising spending has increased dramatically in recent years. The year 2006 alone saw more than USD360 billion spent on advertising worldwide, with the USA leading the industry by contributing almost half of the total advertising spending (World Advertising Research Center, 2007).

Although advertising is important in driving economic growth, it is often done without regards to the consequences of social cost. Internet users are spammed with unsolicited emails that clog up their mailbox while causing financial burdens for Internet service providers. The increasing advertising in public spaces such as schools has some critics claiming it to be a form of child exploitation (Media Awareness Network, 2009).

Breaking out of the clutter of advertising space and yet still delivering the purpose of advertising to targeted audiences necessitates companies exploring new advertising avenues. One such avenue is referred to as Computer Mediated Environments (CME), providing both media outreach through mobile devices and the Internet and interactivity between the consumer and the media. Internet advertising has changed dramatically since its origin in 1994 when the first banner advertisement was commissioned on the Hotwired site (Adams, 1995). The Internet allows consumers to experience a change in their psychological state by creating a sense of presence, which alters their behaviours and provides them with a perceived sense of control (Hoffman & Novak, 1996).

## **2.3 COMPUTER MEDIATED ENVIRONMENTS (CME)**

### ***2.3.1 Interactivity***

The essence of CME is its ability for multi-channel communication often described as interactivity. Interactivity in CME is a continuous two-way transfer of information between a computer and the user, or from user to user, through a computer interface. Examples of interactive media include video games, computer games, the Internet, interactive television, mobile devices, and kiosk-based terminals. The first form of computer interaction consisted of dropping a punched card into a reader to input simple

task commands to the computer. These interactive interfaces have since developed in leaps and bounds to the stage where an average person can easily interact with computer applications through a computer interface. Interactive interfaces come in two forms: (1) tangible interfaces such as, for example, touch pads, touch screens, a computer mouse, computer keyboards, joysticks, and game pads, and (2) non-tangible interfaces such as Graphical User Interfaces (GUI) used to access applications. Interactive media is an interesting communication medium because of its potential capability of altering a consumer's attitude (Fortin & Dholakia, 2005).

Steuer (1992, p. 84) defines interactivity as "the extent to which users can participate in modifying the form and content of a mediated environment in real time". Interactivity offers the ability for users to choose the time, content, and sequence of information they receive in the mediated environment. In order for a communication to be perceived as interactive, information has to be exchanged in real time (Newhagen & Rafaeli, 1996).

The degree of interactivity can be measured in two distinctively different ways. Steuer (1992) considers it from a technical perspective, using information delivery speed (rate of input into mediated environment), range (number of actions), and mapping (system's ability to map controls to environment). Other research (Rafaeli & Sudweeks, 1997; Walther & Burgoon, 1992) measures the interactivity of a mediated communication by how closely it imitates face-to-face communication, that is, face-to-face communication is used as the standard by which other forms are judged.

Interactivity in the context of learning is "a necessary and fundamental mechanism for knowledge acquisition and the development of both cognitive and physical skills" (Baker, 1994, p.1). It is this fundamental mechanism in knowledge acquisition that potentially makes interactivity a superior element in CME advertising, relative to traditional advertising media.

Leckenby and Li (2000, p.3) defined interactive advertising as the "paid and unpaid presentation and promotion of products, service and ideas by an identified sponsor through mediated means, involving mutual interaction between consumers and marketers". Alba, Lynch, Weitz, Janiszewski, Lutz, Sawyer, and Wood (1997)

suggested that interactive communication is characterised by three factors: it is (a) multi-way (it involves two or more actors), (b) immediate (responses occur within seconds), and (c) contingent (response of one actor follows directly and logically from the action of another). Interactivity can be viewed in three different levels: non-interactive, where there is no relationship between the received message and prior messages; reactive, when the received message is related only to the immediate previous message; and interactive, when the message is related to previous messages (Liu & Shrum, 2002).

Despite obvious differences between interactive media and traditional media, interactive media shares many of the same characteristics as traditional media (Stewart & Pavlou, 2002). These similarities mainly involve the purpose of advertising and the eventual expected outcome from the advertising activity. Substantial work on traditional media has focused on the measurement of advertising effects and effectiveness (Stewart 1989; Stewart & Furse, 1985; Stewart, Furse & Kozak, 1983). These fundamental measurements of effects and effectiveness of traditional advertising presents a good measure for the effectiveness of interactive media advertising, although caution is advised when using these measurements, as it is believed that they are inadequate and incomplete when used in CME (Fortin & Dholakia, 2005).

Search and self-selection of information and the way the information is processed in interactive media are important factors in consumer behaviour (MacInnis & Joworski, 1989). According to Stewart and Pavlou (2002), the marketer's message and the way the consumer interacts with the media affects the effectiveness of interactive advertising. However, very few studies have examined the interactivity of marketers, consumers and the advertising message (Oh, Cho & Leckenby, 1999). The lack of research on interactivity may be attributed to the technology being relatively new and to the character of interactive media requiring a different way of conceptualising measures of effectiveness (Stewart & Pavlou, 2002).

Some of the recent work that focused on the measurement of interactive advertising's effects and its effectiveness includes a) theoretical guideline for measuring effects and effectiveness of interactive advertising (Pavlou & Stewart, 2000), b) measures of

effectiveness through study of perception and process of interactive advertisements (Rodgers & Thorson, 2000), c) effects of in-game advertisements such as in-game billboards (Lin & Chaney, 2004), integrated in-game persuasive and entertainment (Grigorovici & Constantin, 2004) and recall of brand placement (Nelson, Keum & Yaros, 2004), and d) effects of interactive advertisements towards consumer attitudes (Sundar & Kim, 2005; Wu, 2005).

### **2.3.2 Internet**

As Stewart and Pavlou state: “the Internet is not just another advertising medium; rather, it is a new channel for interactive marketing that includes communications and in some cases, other elements of the marketing mix such as distribution, product design, and pricing” (Stewart & Pavlou, 2002, p. 379).

The Internet is by far the only media that is able to reach the biggest audience simultaneously around the globe. One of the most notable growth areas in the online sector is the popularity and level of user participation in online social networks. Second Life, an online virtual life social network, has 4.6 million registered users, of which 1.6 million are active users (iTWire, 2008). Facebook, arguably the most well-known social network site, has more than 500 million active users (Facebook, 2011). In August 2006, *The Wall Street Journal* published an article revealing that YouTube, an online video sharing site, was hosting approximately 6.1 million videos, and had about 500,000 user accounts (Lee, 2006). Development of the Internet has also given form to e-commerce, a digital-based interactive form of commercial trading. Consumers can now carry out the whole purchasing process of searching, evaluating, and purchasing on their computer through e-commerce websites without leaving their living rooms.

Businesses are starting to realise the potential of the Internet while learning from the dot.com bust in the late 1990s. One such example of a successful online viral marketing campaign is the ‘Subservient Chicken’, “Have it Your Way” campaign created for the Miami-based advertising firm Crispin Porter + Bogusky by The Barbarian Group (The Barbarian Group, 2004). The viral advertisement ended the day with one million total hits, resulting from a few emails containing the website address being sent to several CP+B staff and asking them to pass the emails on to friends for testing.

The Internet is still in its infancy stage and growing rapidly from international governments' initiatives in expending broadband network coverage, making high-speed Internet connection available to all consumers. Coupled with new Internet technologies being developed constantly, especially on mobile devices, the full marketing potential of the Internet is yet to be realised.

### ***2.3.3 Mobile Devices***

Mobile devices are developing rapidly with new features being incorporated regularly. Mobile devices such as mobile phones, smart phones, PDAs, and laptops used to be high-end gadgets, only affordable by the wealthy, but they have now become accessible to all. According to the U.N. telecommunications agency, in February 2010 there were 4.6 billion mobile phone subscriptions worldwide (CBS News, 2010). China, with the world's fastest growing economy, also has the biggest growth in mobile phone users, with an estimated growth of 19.46% at the end of 2008 according to China's Ministry of Industry and Information Technology (MIIT) (Yuen, 2011). By the end of 2009, the number of mobile phones in use worldwide had surpassed 4.6 billion (ITU Corporate Annual Report, 2009).

As to date (January, 2012), the most powerful mobile phone with a 1.2GHz Dual-core CPU (HTC Sensation, HTC EVO 3D and Samsung Galaxy S II, all released in 2011), is comparable to the processing power of a commercial desktop computer released in 2007. These new age mobile devices are no longer solely used for voice and text communication such as SMS, as they are now equipped with hardware such as a high quality camera, GPS system, accelerometer, velocimeter, touch screen, Bluetooth, and Wi-Fi. On top of that, they also have powerful software installed, such as a word processor, MP3 player, MP4 player, organiser, calendar, phone book, calculator, picture viewer, games, Internet browser, and a whole library of other software applications. These mobile devices run on services such as WAP (Wireless Application Protocol), SMS (Short Message Service), EMS (Enhanced Messaging System), MMS (Multimedia Messaging Service) and i-mode (information-mode), to form a comprehensive communication network. The latest 4<sup>th</sup> generation wireless communication technology (4G) provides access to high-speed, high bandwidth



connections, which can support bandwidth-heavy applications such as full motion videos, video calling, and full Internet access. With wireless Internet technology built into a mobile device, users are effectively able to carry out online activities while on the move. Modern mobile devices do not just place a wealth of information at the fingertips of mobile users through Internet access on demand; they also connect people effortlessly anywhere.

In terms of e-commerce, mobile devices are now being used as a means to purchase and pay for movie tickets, parking tickets, food and drinks from vending machines, with the range of products continuously increasing. A mobile device is no longer solely a means for communication but is now also responsible for filling an essential part of a person's entertainment and management needs, making it one of the top few items that people cannot do without in their everyday life.

Recognising the importance of telecommunication networks, governments around the world have made large capital investments in creating wider mobile network coverage. The wide use of mobile devices such as mobile phones creates an environment where the average user is always connected to a powerful computing device and can interact outdoors while still being digitally connected. Most mobile phones now come integrated with digital cameras for capturing photos or videos. These cameras can also be used to conduct video conferencing calls, adding visual value in important phone calls. Advanced technologies, such as global positioning systems (GPS), are able to specify the phone's position to an accuracy of 3 to 15 meters. In addition, the higher resolution and increased processing power of the newer mobile devices allows for the display of visually stimulating graphics on the mobile device.

### ***2.3.4 Advertising on Mobile Phones***

#### **2.3.4.1 Introduction**

Mobile advertising is a lucrative market in an age where according to ITU, more than half the world's population owns at least one mobile phone (ITU Corporate Annual Report, 2009). The mobile phone is an intensely personal device where each mobile phone is typically unique to one user. This single ownership characteristic makes it an

effective way of delivering precise targeted advertising to consumers resulting in a higher response level compared to traditional media (Borzo, 2002; Mobile Marketing Association, 2009; Xu, Liao & Li, 2008).

In terms of advertising, the freedom of wireless mobile technology allows instant connection with the audience, instant response from the audience, the ability to generate crowd interaction, and the ability to generate interaction with elements in the outdoor environment such as billboards, brand logos and barcodes.

The first advertisement on mobile phone was released by a Finnish news provider six years after the launch of SMS in 2000. The Finnish company offered free news headlines via SMS, sponsored by advertising (Communities Dominate Brands, 2010).

Mobile phone advertisements can be delivered through 3G/4G networks, Bluetooth, WIFI and other wireless technologies. The technology behind the content delivery system is beyond the scope of this thesis, but more information is available from Mobile Advertising Guidelines published by Mobile Marketing Association Mobile (MMA) (Mobile Marketing Association, 2011). However, as pointed out by J. P. Morgan (2010), such guidelines are hard to keep current due to its fast-developing nature.

#### 2.3.4.2 Advertising Modeon Mobile Phones

Advertising on mobile phones can be in the form of SMS (text based advertisements), MMS (image based advertisements), mobile games (in-game advertisements), mobile video (advertisements on mobile TV video), full-screen interstices (which appear while a requested item of mobile content or mobile web page loads), or audio adverts (a form of jingle before a voicemail recording). The mobile technology advertising forms can be categorised into four categories based on technical vividness: voice, image, video, and interactivity (refer to Section 2.6.1 for definition of vividness).

*Voice* - Voice or audio advertising comes in the form of an audio recording. It is delivered to the caller during the transition time when waiting for telephone assistance such as directory assistance or checking mobile phone credit. It can also be delivered

through mobile games or applications. Audio advertisements can take the form of a jingle or voicemail recording. Creating an audio advertisement is relatively inexpensive and provides flexibility because of the short lead time required to produce them. This makes it one of the more efficient mediums (Katz, 1995). Unfortunately, this type of advertisement is often lost in the background due to the lack of a visual component (Barton, 1970).

*Image* – Image or static visual advertisements can be in the form of text or graphics. SMS is the simplest form of image advertisement. Graphic advertisements originally started with MMS, and as more mobile devices connect to the Internet, marketing revenue that was once only available via personal computers such as web banners has become available. Image advertisements are also delivered to users through mobile games and applications in the form of branding, in-game advertisements, or interstices. Similar to print advertising, mobile visual advertisements allow for the presentation of detailed information and allows individuals to process information at their own pace. Reliability, ease of use, low cost, discretion and confidentiality, and instantaneous delivery, makes SMS an ideal marketing tool. Although a simplistic form of mobile advertising, SMS based advertising has been estimated to generate over 90% of mobile marketing revenue worldwide (Keshtgary & Khajepour, 2011). Juniper Research, predicts that around 3 billion mobile coupons will be issued to mobile users by 2011, with around \$7 billion worth of discounts redeemed (Goode, 2008). One drawback of an image advertisement is that it requires effort and attention from individuals to actively process the image information in order to create an impact (Katz, 1995).

*Video* – Video advertisements contain both voice and image components with the addition of animation. Similar to television advertising, mobile video advertising is able to deliver messages visually and aurally (Katz, 1995), allowing creative executions using sight, sound, colour and motion (Belch, 2008). Mobile video advertisements can be delivered to an audience during the receipt of mobile TV, as full-screen interstices which appear while a requested item of mobile content or when a mobile web page is loading. Similar to voice and image advertisements, video advertisements can also be delivered to users through mobile games and applications. The ability of video media to stimulate multiple sensors gives it a greater persuasive ability as opposed to single

sensemedia (Katz, 1995). One drawback is that video advertisements are expensive to produce.

*Interactivity* – Similar to the Internet, mobile technology operates in real time and therefore provides the ideal platform for interactive advertising. The advantage of interactive advertising is in its ability to incorporate cross media advertising. This is achieved through call-to-action using print, radio, web, and television media. Traditional interactive advertisements were limited to the use of caller initiated voice calls and keypad interface SMS replies. The introduction of built in digital cameras, web enabled phones, GPS, and faster processors in the mobile phone, has allowed this interaction to evolve to a whole new level. Digital signatures from GPS and mobile phone transmission nodes enable individual mobile phones to interact with the media provider, allowing the delivery of relevant location-based advertising content. Mobile phone cameras can be used to scan 3D markers encoded with web addresses, automatically directing users with web enabled mobile phones to the web address. Coupled with faster CPUs, mobile phones are able to deliver 3D advertisements using Augmented Reality, which enhances the sense of presence through 3D interaction (Hoffman & Novak, 1996). Interactive advertisements can be delivered within mobile games, applications, web banners, and more as the technology develops. Few would argue the benefits of interactivity in advertising. However, caution should be taken as the “more-is-better” theory supported by conventional media does not necessarily lead to improved communication effectiveness for interactivity (Fortin & Dholakia, 2005).

#### 2.3.4.3 Recent Research on Mobile Advertising

Advertising on mobile phones was first introduced in the year 2000 (Andersson, Nilsson & Nilsson, 2000). The short existence of this type of advertising means that researchers are only just beginning to understand its implications. Very few studies can be found focusing specifically on mobile phone advertising. Those that exist tend to focus on SMS advertising (e.g. Amen, 2010; Barwise & Strong, 2002; Carrol, Barnes & Fletcher, 2007; Mir, 2011; Tsang, Liang & Ho, 2004; Wong & Tang, 2008). Recent developments in mobile phone technology mean that highly vivid advertisements can now be delivered to users through their mobile phones. Unfortunately the recent nature

of this development also means that no literature can be found investigating different forms of advertising on mobile phones.

Among the research in mobile advertising are papers on a) effects and effectiveness of mobile advertising (Drossos, Giaglis, Lekakos, Kokkinaki & Stavraki, 2007; Nasco & Bruner II, 2007) b) location-based advertising (Bruner II & Kumar, 2007; Unni & Harmon, 2007), and c) studies of mobile commerce (Troutman & Timpson, 2008).

In the area of effects and effectiveness of mobile advertising, researchers found that incentive, interactivity, appeal, product involvement, and attitudes toward SMS advertising directly influenced users' attitudes toward the advertisement, the brand, and purchase intention (Drossos et al., 2007). Research by Nasco and Bruner II(2007) found that modalities such as audio, text, and pictures significantly affected consumer's perceptions toward, and their recall of, the commercial content, but did not affect perceptions of the mobile device itself, or influence behavioural intentions and attitudes toward mobile advertising on wireless devices.

The availability of modern web enabled mobile devices has presented opportunities to retailers and consumers to participate in mobile commerce. In an effort to improve the usability of mobile commerce, previous research has been conducted on mobile-based web browsing, to optimise the layout for mobile commerce. (Troutman & Timpson, 2008).

#### 2.3.4.4 Conclusion

The prospect of having a mobile device that offers GPS, instant access to information, instantaneous response, high computer processing power, and an in-built digital camera, opens up an advertising opportunity never previously available.

The social networking company Facebook Inc. and search engine company Google Inc. are reported to have earned USD800 million in 2009 (Reuters, 2010) and USD28 billion in 2010 (Google, 2010) from advertising revenues. Recently these two leaders have taken steps to tap into the mobile advertising market. In 2005, Google purchased Android Inc., a mobile operating system, middleware and key applications software

company to go into mobile development (Businessweek.com, 2005). Similarly, Facebook acquired Snaptu, a mobile application platform that is less sophisticated than those on smartphones in March 2011, for US\$70 million (Reuter, 2011). These purchases suggest that both companies foresee the potential of mobile devices in advertising.

The effectiveness of a mobile advertisement campaign is currently measured by impressions (views), click-through rates, conversion rates, such as click-to-call rates. Mobile campaigns have significantly higher click-through rates compared to desktop computer based Internet campaigns (MMA, 2009).

Despite the impressive number of users and the huge potential pool of the advertising audience, advertising spending on mobile phones only accounts for less than 1% of total global advertising spend (Gartner, 2011). According to Gartner Inc. (2011), mobile advertising generated US\$1.6 billion revenue in 2010. As an interactive mass media with similar characteristics to the Internet, mobile devices have the ability to generate viral marketing effects through engaging interactive campaigns.

### ***2.3.5 MEDIA TOOLS: Augmented Reality (AR) in Advertising***

#### **2.3.5.1 Introduction to Augmented Reality**

As opposed to virtual reality, which offers a total immersive environment and ‘replaces’ reality, AR augments the real world scene with the user maintaining a sense of presence in the world, but with an “enhanced” reality. According to Azuma (1997), AR is defined to have the following three characteristics: a) it combines real and virtual, b) it is interactive in real time, and c) virtual content is registered in 3-D space.

In 2007, Gartner Inc., identified AR as one of the “Top 10 Strategic Technologies for 2008” (Gartner, 2008), and in 2008 MIT Technology Review website listed AR as one of the top 10 emerging technologies that they found “most exciting—and most likely to alter industries, fields of research, and even the way we live” (Technology Review, 2008).

The first augmented reality application was developed in the 1960s by Ivan Sutherland, with a see-through head-mounted display. This was followed by Tom Furness' research between the 60s and 80s in the US Air Force on helmet-mounted displays and the development of the Super Cockpit. In the early 1990s, Tom Caudell from Boeing coined the term "Augmented Reality" when developing a wire harness assembly application (Caudell & Mizell, 1992). In the late 1990s, researchers started developing application tools and studies on interaction and usability theories. It was not until recently that commercial AR applications started to appear more widely.

Jun Rekimoto of Sony CSL, an expert in AR, best describes AR's interface as depicted in *Figure 2.a* (Rekimoto & Nagao, 1995). According to Rekimoto, in a graphical user interface (GUI), a gap exists between the real world and the virtual world. Interaction of a virtual object requires manipulation of a real world object such as a mouse, a touch pad, or a keyboard. In virtual reality, users have no interaction with physical objects to manipulate virtual world objects. Ubiquitous computing however, allows users to interact with multiple discrete computers in a real environment. Augmented Reality, on the other hand, strives to provide an invisible interface where users interact with the real environment to manipulate virtual world objects.

There are various methods for achieving AR, such as the use of head mounted displays (HMD), mobile phones and desktop monitors., however, the technology behind AR is beyond the scope of this thesis. Interested individuals may obtain more information on AR from Azuma (1997), Azuma, Bailiot, Behringer, Feiner, Julier and MacIntyre (2001), and Feiner (2002). To achieve an AR experience, a mobile phone will have to have a camera, a fast enough computer processor to render the augmented image in real time, and the relevant software installed.

Observation of the global trend has showed growing interest in AR that has since led to numerous AR applications in engineering, architecture, medicine, education, psychology, entertainment, and marketing. One of the early entertainment applications was the PlayStation 3 game, 'Eye of Judgement'. The use of AR enhances this game by incorporating interactivity and bringing the children's card game such as 'Yu-Gi-Oh' into life. The game has sold over 250,000 copies since being released in October 2007.

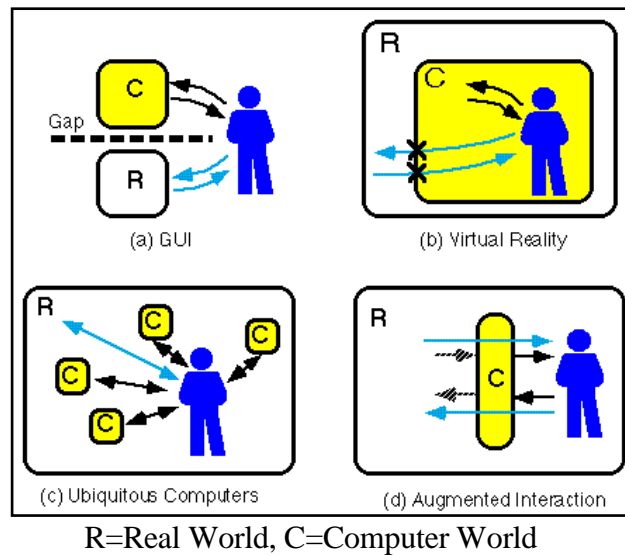


Figure 2.a: Computer Interfaces

*Source: Computer interfaces depicted by Jun Rekimoto, Sony CSL (Rekimoto, 1995)*

In the advertising arena, 2007 saw Hyperfactory, a leader in the field of wireless application development and wireless marketing space in Australasia, joining forces with Christchurch technology interface specialist HITLab NZ and Saatchi and Saatchi Wellington, to create the Wellington Zoo campaign using AR on mobile phones. This mobile AR concept broke news and won numerous awards when it was recognised as the world's first ever AR advert on mobile phones. In 2008, Hyperfactory again partnered with HITLab NZ (Motim Technologies) with the development of a mobile AR ad as part of Nike's campaign in the launching of their new Total 90 soccer shoe in Hong Kong (Motim Technologies, 2008). Zhang, Navab and Liou (2000) introduced the concept of using AR in e-commerce direct marketing in the IEEE – 2000 International Conference on Multimedia. This paper was however, focused on technology research and failed to follow through with the marketing aspect.

### 2.3.5.2 The Benefits of AR in Advertising

One benefit of using AR technology is the ability for it to operate on mobile devices as well as on a desktop computer. The use of AR applications requires that the mobile devices be equipped with advanced mobile technology such as a fast computer processor, an adequate capture frame rate for the digital camera, an adequate storage capacity for the installation of the software application, and the means to obtain the



application through cabled or wireless sources. Although these can be perceived as limitations for use on general mobile devices, they also act as good predictors for the future use of interactive technology in mobile advertising, as they operate at the limit of existing technology.

The AR interface offers an exciting way to interact with the computer directly without the use of input devices. Enhancement of reality is offered by the use of visually stimulating images, videos or graphics, by augmenting them into the real world through the insertion of new objects or substitution of real world objects by overlaying virtual objects. Coupled with facial and natural feature tracking technology, the ability for interactivity that reacts to human expression is now a possibility. Ultimately, what makes AR interesting is that it is a technology that can be implemented in gaming and advertising. The ability for a device that allows users and marketers to change humans into walking signboards or objects into popup posters presents an exciting advertising concept.

Another advantage of AR is the ability for advertising companies to increase advertising space and revenue by utilising the same advertising space for different advertisements. Media rich interactive advertisements such as the incorporation of 3D graphics, videos and audio can be presented to the consumers in an effort to create better levels of brand awareness.

## **2.4 PRODUCT INVOLVEMENT**

In this section, a definition of product involvement is provided, and relevant literature exploring the role of product involvement in advertising is presented.

### ***Involvement Definition***

According to Andrews, Durvasula and Akhter (1990) and Mitchell (1981), involvement is an internal state of arousal that is made up of three major properties: intensity, direction, and persistence. *Intensity* is identified as a person's degree of involvement or motivation. This level of involvement ranges from low to high on a continuous scale (Antil, 1984) and varies with products, situations, and individuals. It is important to

note that although individual consumers may manifest different levels of involvement for different product classes and purchase situations, some product classes and purchase situations are generally perceived to be more highly involving than others (Hupfer & Gardner, 1971). *Direction* is defined as an individual's motivation towards the object or issue (Mitchell, 1981), and *persistence* is the duration of the involvement intensity (Celsi & Olson, 1988).

#### **2.4.1 Product Involvement Definition**

Product involvement and its characteristics have long been identified as a significant variable in the consumption behaviour of adult consumers, as well as an important factor in the way young people process marketing and advertising information (Muratore, 2003; Te'eni-Harari & Lehman-Wilzig, 2009). Decision making processes, consumption behaviours, and advertising receptivity are some of the characteristics that are also influenced by product involvement (Arora, 1982, 1985; Beatty & Smith, 1987). Slama and Tashchian (1985) suggested that involvement with an object influences attitudes and behaviours towards the object. Hence, involvement plays an essential role in explaining consumer behaviour and decision making.

The literature contains multiple definitions of product involvement. Mittal and Lee (1989) define product involvement as the degree of interest a consumer has in a product category on a continuous basis. Bloch (1986), Flynn and Goldsmith (1993) and Mittal and Lee (1989) suggested that product involvement is the feeling of interest, enthusiasm, and excitement a consumer has about a product category. Celsi and Olson (1988) and Mowen and Minor (1998) define product involvement as the perceived personal importance and consumer's interest that is attached to the acquisition, consumption, and disposition of an object, service or idea. Bloch (1981) defines product involvement as a person-specific characteristic, and therefore it is possible for consumers to have different degrees of involvement with the same product or brands within a product category.

Warrington and Shim (2000), suggested that product involvement is analogous to the concept of ego involvement. As defined by Sherif and Cantril (1947), ego involvement occurs when an issue or object is related to the attitudes and values of an individual's

self-concept. Warrington and Shim (2000) argue that this is similar to Houston and Rothschild's (1978) definition of product involvement, an attitude that is activated when a product category is related to a person's centrally held values and self-concept.

#### **2.4.2 Product Involvement Categorisation**

According to Kotler and Armstrong (2008, pp. 145-146), product involvement can be categorised into four different types of behaviours: *complex buying behaviour*, *dissonance-reducing buying behaviour*, *variety seeking buying behaviour* and *habitual buying*.

In terms of involvement intensity, the high-involvement category is associated with purchases that require more time and effort to be spent in search-related activities (Bloch, Sherrell & Ridgeway, 1986), require high expenditure, are purchased infrequently, are highly self expressive, or carry personal risk. Examples of such purchases include buying a house, buying a car, or making financial investments. Cars have been found to be a class of relatively high ego-involvement product for many consumers (Hupfer & Gardner, 1971) as they are important purchases that are chosen carefully and are sometimes thought to reflect the owner's personality. Conversely, the low-involvement category involves low-cost and frequently purchased products that require very simple evaluation processes and are not considered as highly ego involving across groups of consumers. Examples of low-involvement products include soft drinks, paper towels, and other nondurables (Hupfer & Gardner, 1971).

Zaichkowsky's (1985) examination of the level of product involvement among thirteen product categories found there was a significant difference in the level of product involvement for various products. In her study, a low level of product involvement was found for instant coffee, bubble bath soap, and breakfast cereal, a medium level of product involvement for facial cream, mouthwash, headache remedies, and tissues, and a high level of product involvement for calculators and cars. An independent study by Kapferer and Laurent (1986) of twenty product categories also found variation in product involvement for different products. In their study, a higher level of product involvement was found for clothing and perfume categories compared to other product categories.

Each of these high and low involvement product categories can be sub categorised into those showing significant differences between brands and those showing few differences between brands. Consumers going through the process of purchasing high involvement products that have significant differences between brands are considered to be displaying *complex buying behaviour*. However, if the product requires high-involvement and has few differences between brands, consumers are categorised into displaying *dissonance-reducing buying behaviour*. Alternatively, in a purchasing process that involves product that exhibit low-involvement and that has significant differences between brands, consumers will display *variety-seeking buying behaviour*. Finally, in scenarios where low-involvement products and few differences between brands are present, consumers will display *habitual buying behaviour*. Figure 2.b shows this categorisation of buying behaviour.

Previous research has indicated that product attributes have a significant role to play in consumer product evaluation (Deighton 1997; Klein 1998; Smith 1993; Smith & Swinyard 1982; Wright & Lynch 1995) where product types can affect the way consumers evaluate the product (Klatzky, Lederman, & Matula 1991; Norman 1998). Hence, in any research investigating product involvement, it is necessary to undertake the study with different product categories.

|   | High-Involvement                            | Low-Involvement                         |
|---|---|---|
| Significant differences<br>between brands | Complex<br>buying<br>behaviour              | Variety-<br>seeking<br>buying behaviour |
| Few differences<br>Between brands         | Dissonance-<br>reducing<br>buying behaviour | Habitual<br>buying<br>behaviour         |

Figure 2.b: Four Types of Buying Behaviours

Source: Adapted from Henry Assael, *Consumer Behaviour and Marketing Action* (Boston: Kent Publishing Company 1987), p. 87. Copyright © 1987 Wadsworth, Inc.

### ***2.4.3 Consumer Involvement***

Although it is generally accepted that involvement can be classified as product defined, some researchers argue that involvement should strictly be classified as consumer defined, as no product is intrinsically ego involving or uninvolved (Lastovicka, 1979; Tyebjee, 1979). Traylor (1981) argues that only consumers can be ego-involved and that for any given product class, one group of consumers can be highly involved and another not.

Instead of categorising product involvement into high and low involvement, some consumer behaviour theorists categorise product involvement into Situational Involvement (SI) and Enduring Involvement (EI) (Bloch & Richins, 1983; Houston & Rothschild, 1978; Laurent & Kapferer, 1985; Richins & Bloch, 1986; Rothschild, 1979). SI occurs in a risky purchase situation and in a high and relatively short-term interest in a product, whereas EI reflects a person's ongoing interest with a product.

### ***2.4.4 The Role of Product Involvement in Consumer Behaviour***

Product involvement reflects the recognition that a particular product category may be more or less central to people's lives, their sense of identity, and their relationship with the rest of the world (Traylor, 1981). Moreover, studies have found that the product-involvement variable is constant and stable, relative to many other variables.

Research has found that consumer involvement in products has a significant effect on the outcome of consumer behaviour. Consumers are less likely to believe claims of low involvement products but more likely to believe claims of high involvement products (Mueller, 2006). Levy and Nebenzahl (2008) established that product involvement influences interactive communication behaviour, while the type of information being sought is a function of the advertised product category. A relationship also exists between product involvement and brand loyalty (e.g., Iwasaki & Havitz, 1998; LeClerc & Little, 1997; Traylor, 1981). Consumers' perceptions with respect to different products can differ; hence, the perception of involvement may vary with different products. As a result, the product involvement construct may serve marketers and

advertisers in the long-term (Havitz & Howard, 1995; Iwasaki & Havitz, 1998; Quester & Smart, 1996).

Researchers have cautioned against oversimplifying the relationship between product involvement and brand loyalty in a dichotomous manner that may obscure a more accurate understanding of the relationship. A simple relationship does not exist between product involvement and brand loyalty; rather, different aspects of the consumers' involvement profile have different influences on brand loyalty (Kapferer & Laurent, 1993). Richins and Bloch (1986) emphasised that future theoretical and empirical work on product involvement should identify whether SI or EI is being studied.

## **2.5 CONSUMER GOALS**

In this section, relevant literature identifying the role of consumer goals in advertising is presented.

The field of consumer behaviour is the study of the psychological processes involved when individuals or groups recognise a need, interpret information, select, purchase, and use a product or service to satisfy their desire. The study of consumer behaviour is not limited to the act of buying, but also involves how the presence of possessions affects people's lives and the way people feel about themselves and others around them (Solomon, 2004, p.8). Consumer behaviourists achieve greater understanding of consumers by segmenting the population into different characteristics based on demographic characteristics and behavioural variables and identifying different influences on consumers.

“Much of consumer behaviour is goal orientated” (Bagozzi & Dholakia, 1999, p.19) as seen in such acts as buying a camera for the next big vacation trip, searching for an anti-perspirant that smells great, or getting a haircut for an interview. Goals are described by The American Heritage Dictionary of the English Language as “the purpose toward which an endeavour is directed; an objective” (The American Heritage Dictionary of the English Language, 2009). According to Stewart and Pavlou (2002), to understand any interaction, one has to identify what the person is attempting to achieve. The notion of goal oriented and goal-driven behaviour is consistent with research on the retrieval

and use of information of attitude, and choice behaviour whereby a goal to purchase is made up of determining the importance of different product attributes, the evaluation of alternative brands, and brand choice (Bettman, 1979).

Huffman and Houston (1993) demonstrated the importance of goals when consumers are learning about brands and products, whereas Barsalou's (1991) research in cognitive psychology found that consumers' goals play a crucial part in the network of information associated with products. Murphy and Medin (1985) argued that it is impossible for actors to determine relevant properties that are useful for the task of creating meaning without some guiding force. Barsalou (1983, 1992) again suggested that the goal is what motivates people to seek and organise information. According to Pervin (1983) goals are what organise and regulate behaviour through cognitive, affective, and behavioural process. These cognitive organisational structures are a part of any interaction that takes place among actors and influence the structure of interaction over time (Stewart & Pavlou, 2002).

Research has found that based on best information available, people tend to form ad hoc categories that are not well organised and subject to frequent changes (Barsalou 1982, 1983, 1985, 1991, 1992). This means that when applied to the context of interactive media, as users seek for more efficient ways to achieve goals, the way people interact with the media and the sequence of interaction will tend to change over time (Stewart & Pavlou, 2002).

Goals and actions can be linked to various degrees with some actions more tightly than others (Stewart & Pavlou, 2002). Barsalou (1991) refers to this degree of fit as graded structure. There are several measures of graded structure that exist. However, in the context of interactive media, the two most relevant are *ideals* and *goodness of fit* (Stewart & Pavlou, 2002). According to Stewart and Pavlou (2002, p. 384), *Ideals* are the "concrete or abstract attributes (e.g., an action or behaviour) that an element in a category should possess if it is to best serve the fulfilment of a particular goal" while *Goodness of fit* is a measure of "how strongly an action is linked to a particular goal".

For every purchase made, the consumer goes through a process called the buyer decision process. This consists of five different stages: a) need recognition, b) search for information on products that could satisfy the needs of the buyer, c) alternative selection, d) decision-making on buying the product, and e) post-purchase behaviour. Kotler and Armstrong (2008, pp. 147-149) describe the different stages of the buyer decision process as follows:

- Need Recognition
  - » The consumer recognises a problem or need.
- Information Search
  - » The consumer is aroused to search for more information; the consumer may simply have heightened attention or may go into active information search.
- Evaluation of Alternatives
  - » The consumer uses information to evaluate alternative brands in the choice set.
- Purchase Decision
  - » The buyer's decision about which brand to purchase.
- Post Purchase Behaviour
  - » The consumer takes further action after purchase, based on their satisfaction or dissatisfaction.

Through understanding consumer behaviour, companies may deliver benefits to consumers and influence consumer perceptions. Companies that are able to understand and utilise this consumer behavioural information through better development of marketing strategies (e.g., putting greater importance on consumer retention, customer relationship management personalisation, customisation and one-to-one marketing) will end up achieving greater success (Assael, Pope, Bernnan & Voges, 2007).

## **2.6 VIVIDNESS**

### ***2.6.1 Vividness Definition***

Graphical vividness is described as a “pictorial that evokes lifelike images within the mind” (Glossary.com, 2012). In terms of presentation of information, vividness is



defined as “attention seeking and exciting imaginatively to the extent that it is emotionally interesting, concrete and imagery-provoking and proximate in a sensory, temporal or spatial way” (Nisbett & Ross, 1980, p.45). As defined by Steuer (1992, p.11) in a mediated technology environment, “vividness means the representational richness of mediated environment as defined by its formal features, that is, the way which an environment presents information to the senses”.

Vividness is made out of two components, sensory *breadth* described by the number of senses being stimulated and sensory *depth*, the “quality” or amount of information being delivered to the senses (Steuer, 1992). Vividness is also referred to as media richness (Daft & Lengel, 1986).

The common misconception is that vividness is often mistaken for interactivity (Hoffman & Novak, 1996; Rafaeli, 1988; Steuer, 1992). Interactivity is different from vividness because of its fundamental ability for two-way communication. A media can exhibit high vividness while remaining non-interactive (e.g., posters, magazines and television,) or exhibit low vividness with high interactivity (e.g., text email and SMS ). Different media technologies are generally classified between the two scales of vividness and interactivity, as shown in *Figure 2.c*.

### ***2.6.2 The Role of Vividness***

Information presented in a highly vivid manner is believed to have a strong effect on people’s attitudes (Nisbett & Ross, 1980), an assumption derived from the consistent use of vividness in advertising and other persuasive media (Aaker, 1975; Ogilvy, 1963).

Research by Kim and Biocca (1997) revealed that an increase in persuasion can be achieved in a mediated environment by creating a sense of presence. According to researchers, this sense of presence can be heightened by increasing the number of sensory depth outputs induced by the medium or vividness. This effect was shown by Short et al. (1976) in which the media that uses both audio and visual stimuli produced greater social presence than audio alone. Sensory breadth such as higher graphic resolution and larger image size also exhibits a role in inducing a higher sense of reality

and perception of presence (Bocker & Muhlbach, 1993; Lombard, 1995; Reeves, Detenber & Steuer, 1993).

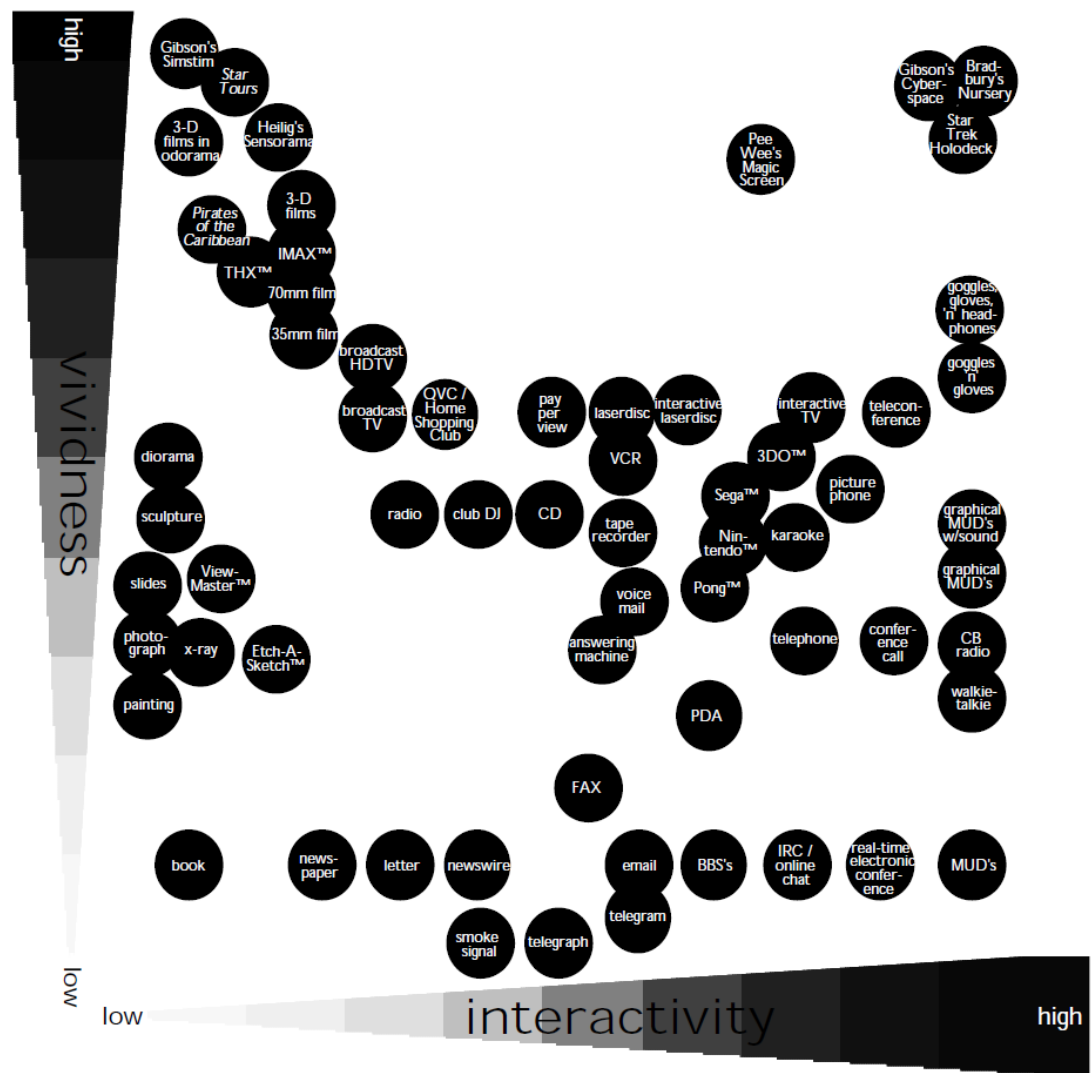


Figure 2.c: Various Media Technologies Classified by Vividness and Interactivity

Source: *Defining Virtual Reality: Dimensions Determining Telepresence* (Steuer, 1992)

A review of the literature revealed conflicting results concerning the effect of vividness on consumer attitude or judgement. Experiments have shown that people's judgements are unaltered when vividness is manipulated against concrete (technical e.g., replay feature) and abstract (emotional e.g., freedom) messages (Borgida 1979; Gottlieb, Taylor & Ruderman 1977). Vividness also fails to show an effect on judgments in the

situation where vividness in presentation format (Manis, Dovalina, Avis&Cardoze, 1980) and instructions to image (Fiske, Taylor, Etcoff & Laufer, 1979) are altered.

Conversely, Kisielius and Sternthal (1984) found evidence of what is believed to be the vividness effect on judgment. Effects of vividness on judgement are often confined to specific boundaries. Chaiken and Eagly (1976) found that audiovisual messages had a greater influence than audio or print when presenting simple comprehensible messages. However, when the message was difficult to understand, the print message condition induced more pro-message opinion change than the audiovisual or audio conditions. Experiments by Andreoli and Worchel (1978) found that audiovisual messages induced more positive judgment toward the message than audio or print information only when the information was from a credible source, but found the opposite effect when the source lacked credibility. Reyes, Thompson, and Bower (1980) found that concrete messages provoked greater influence compared to abstract messages only in a delayed post-test condition.

This literature review on vividness has shown that the construct vividness has been poorly defined among researchers. Even within the same study, different operational definitions, such as, content vividness, instructional vividness (use logical or imaginative thinking), relevance to subject or abstract/concrete message are sometimes used (Anand-Keller and Block, 1997). Contextual based differentiation of vividness is clearly required when using the construct vividness as there are obvious differences between different types of vividness used in past research.

## **2.7 THE NOVELTY EFFECT**

Previous research studies have found that novel stimuli are able to stimulate active information processing, resulting in better recall and recognition when compared to the use of non-novel stimuli or recently seen stimuli (Fahy, Riches & Brown, 1993; Li, Miller & Desimone, 1993; Riches, Wilson & Brown, 1991; Wilson & Rolls, 1993).

In the context of advertising, Locander (1987) studied product novelty in an advertising situation and found that a novel product produced a significantly stronger affective reaction and positive attitude than a familiar product. Study of 3D product presentation

revealed that novelty was important in shaping purchase intention and attitudes toward the websites showing 3D products (Edwards & Gangadharbatla, 2001).

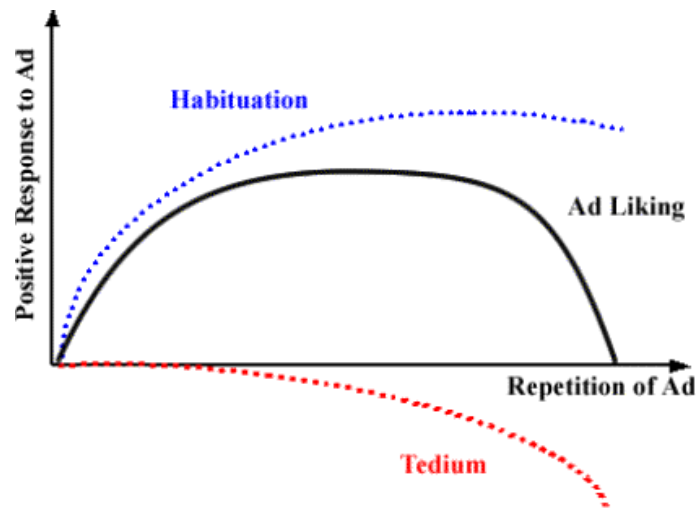


Figure 2.d: Schematic Diagram of the Habituation-Tedium Theory

Source: *Effective Frequency: One Exposure or Three Factors?* (Tellis, 1997)

The effect of novelty is best described by Tellis (1997). In his paper, he theorised that viewers tend to feel uncertain and tensioned when first exposed to novel advertisements. These emotions were later replaced through two processes called *habituation*, developed from familiarity to the advertisement and *tedium*, developed from boredom due to increased exposure to the advertisement. *Figure 2.d* shows the relationship between *habituation* and *tedium*. As exposure to the same advertisement increases, *habituation* provide positive effects that peak and then slowly decline. The negative effect of *tedium* however, develops later but in a constant declining manner. Tellis (1997) explains that this combination of *habituation* and *tedium* process curve may explain why people respond positively towards advertisements with novel stimuli but become increasingly critical of the advertising message as novelty wears out.

## 2.8 CHAPTER SUMMARY

The literature review in this chapter has laid out information relevant to this study. Starting with a brief introduction to the purpose of advertising, the term Computer Mediated Environment (CME) was then introduced. Advertising in CME was identified as a fast growing sector, with evidence of a huge market potential for advertising on a

mobile platform. Literature on Internet and mobile advertising were then presented in the context of CME where focus was put on the unique attributes of mobile advertising.

Past research and definition of product involvement, stage of buyer decision process, and vividness were presented. All three have been identified as important variables in studying the effectiveness of advertising; however, there is a lack of research where all three of these variables are simultaneously taken into account.

Literature has shown that the novelty effect also plays an important role in defining consumer attitude, and should not be ignored in any study which involves advertising in new media.

Information provided in this chapter will form the foundation of the conceptual model, and lead to the development of research hypotheses introduced in the next chapter.

### **3.1 INTRODUCTION**

To fully understand the relevant issues and concerns in the field of mobile advertising, exploratory research using qualitative methodology was undertaken in an attempt to better understand both the media consumer and the media provider's perspective. Two approaches were used – a focus group examining the consumer's perspective (reported in Section 3.2), and an interview examining the technology provider's perspective (reported in Section 3.3). Section 3.4 summaries the findings.

### **3.2 FOCUS GROUP**

#### ***3.2.1 Methodology***

A focus group was conducted in the Management Department at the University of Canterbury in July 2008. The purpose was to identify the potential use of mobile augmented reality (AR) in advertising and the problems that the technology might have in this application area. The findings were used to address issues surrounding the technology as a marketing tool and to assist in ensuring that future AR technology development is consumer orientated. This focus group study also served as a platform to formulate the research framework.

The focus group followed the following sequence. An initial email was sent out on 29<sup>th</sup> July 2008 to Doctoral, Masters and Honours students in the Management Department inviting them to a social gathering with an interactive technology theme. A second email was sent on 31<sup>st</sup> July 2008, the day the focus group was conducted, as a reminder of the event. Ten participants turned up for the focus group with 8 male and 2 female participants, aged between 22 and 35. The focus group consisted of a thirty-minute session with the proceedings recorded on a micro cassette. Demonstrations of a mobile AR game (AR Tennis) and a mobile AR advertisement (AR Nike) were conducted and participants were asked to engage with the mobile applications. Participants were then asked to respond to a series of questions relating to their experience, feelings and opinions. Participants' behaviour was also observed during their engagement with the device and media.

Based on the recommendations by McNamara (2008), a series of seven core questions were prepared and asked during the focus group session. These questions were designed to address impressions, relations, applications, problems, implications and solutions to the use of the technology in marketing. The questions were as follows:

- Q.1     What is your impression of this technology?*
- Q.2     Have you seen something similar to this before or something that gives you the same impression?*
- Q.3     How do you see this technology being applied in marketing?*
- Q.4     What do you not like about the technology and the potential problems with this technology?*
- Q.5     What do you think the negative effect of using this technology might have in marketing?*
- Q.6     What improvements can be made to this technology to make it a better marketing tool?*
- Q.7     Is there anything else you would like to add to this topic that I might have potentially missed?*

Questions were asked in this order to encourage participants to initially absorb the experience that they had just encountered (Q.1), followed by a question on how they related this experience to their lives (Q.2). Participants were then asked for their opinions on how they see this technology being applied in marketing (Q.3). Q.4 was designed to put participants in a negative opinion state before inviting them to identify the negative effects that this technology might have in marketing (Q.5) and the potential improvements that might be required to solve these issues (Q.6). With the participants now fully immersed in the pros and cons of the technology, a free flow discussion was then initiated. A summary of the focus group discussion can be found in Table A.3a of Appendix One.

### **3.2.2 Results**

#### **3.2.2.1 Observation of Behaviour**

Participants were generally excited about the technology with an obvious greater interest shown by male participants compared to female participants (although there were only two females in the focus group). There was an initial excitement about the technology but this quickly declined. The purposes of the applications were then revealed (code finding and tennis game play), which reignited interest from the participants. Participants spent significantly more time on the mobile game than on the code finding AR application.

Despite participants wanting to continue with the hands-on demonstration of the AR tennis game, the demonstration had to be concluded to allow for focus group discussion.

#### **3.2.2.2 Impression**

The use of AR technology as a marketing tool appeared to deliver positive reinforcing emotions to the participants. In addition, participants tended to take more notice of the AR advertisements as opposed to conventional advertisements due to the difference in the delivery method. Whether this increase in ad interest equates to greater message retention and brand retention requires further research.

Participants suggested that mobile AR can be seen as a good technology for companies who would like to use it to attract technology-minded early adopters. However, it is unclear if the technology itself is a target for early adopters or if the technology can be used as an effective tool for marketing products that target early adaptors. Mobile AR was also suggested to have the potential of being a good viral marketing tool.

#### **3.2.2.3 Relation**

Mobile AR marketing was seen as an approach that was so unique that participants initially struggled to relate this type of marketing approach to any existing model. Once the purposes of the advertisements were revealed, participants eventually related the



experience to the excitement and thrill they get when using “scratch-it” cards with hidden special codes. Participants also related the uniqueness of this marketing approach to the word-of-mouth marketing campaign carried out by Sony Ericsson Mobile, where actors posed as Japanese tourists asking passers-by to take their photo, demonstrating the camera phone’s capabilities (Shin, 2006). The gaming aspect of the mobile AR on the other hand, reminded them of 3D games.

To enhance the interactivity of the advertisement, participants suggested the need to introduce a purpose to the advertisement experience in order to create a sense of fun and motivation. Animating the content of the advertisement instead of having static images was also suggested as having the ability to enhance the user experience.

#### 3.2.2.4 Application

Suggestions for the application of mobile AR as a marketing tool included the use of digital markers that are presented on TV or Internet and also the use of user printable markers for portability. Participants also suggested that with the current relaxation of regulations regarding the use of electronic devices on planes for some airlines, AR markers could now be placed in airplane complimentary magazines for entertainment purposes such as a code finding competition or gaming when used with the mobile AR applications.

Newer applications of mobile AR do not require specially designed geometric markers to display and track the image. This is referred to as markerless tracking (Simon, Fitzgibbon & Zisserman, 2000). When asked to consider mobile AR applications without the constraint of markers, participants did not suggest improving mobile AR application by using markerless tracking, suggesting that they were unaware of the technology or unaware of its benefits.

Another possible advantage of using mobile technology proposed was the potential access to personal data from the mobile number registry system. Personal information from the mobile number registry system could potentially be used to create personalised advertisements. This will however bring forward ethical issues that require a permission based opt-in advertisement system to be introduced.

#### 3.2.2.5 Problems

A number of usability issues were identified in the focus group session. The screen size, as one of the major contributors to usability, had a negative effect on the user experience. Participants found the screen size a bit small for comfort. When using mobile AR, participants were also required to have steady hands for tracking purposes.

Another major contributor to the usability issue was the delivery and installation of the applications. The media will be deemed unattractive and users will easily lose interest if the whole process of using the application (which includes downloading and installation) requires longer than a minute to perform. A third delivery issue involved AR technology that required decent computer processing power on mobile devices. Participants indicated that some users would feel left out if they are unable to get the application working on their mobile devices.

#### 3.2.2.6 Implications

As mobile AR media involves a high degree of technology, there was a perception that this media will limit the target market to the group of users who are interested in technology. The use of high technology also means that some users who have lower specification mobile devices will be excluded from being able to run the applications. Users who have incompatible mobile devices and who are consequently excluded from using the applications may inevitably become disgruntled users, ultimately giving the advertising brand a negative reputation. Participants believed that the worst scenario was when the software was downloaded and the user then finds out that it does not work.

Similar to all other types of marketing campaigns, participants believed that repeated use of the same mobile AR marketing concept would lose its appeal regardless of the use of different graphics/animation or products/services advertised in the campaign. The use of similar concepts may portray a monotonous effect when it loses its 'wow' factor.

### 3.2.2.7 Solutions

However, participants believed that these problems with the potential limitations of the technology could be overcome with a few fundamental measures. Effectively, the whole system must be flawless before deploying the technology as a marketing tool. Quality of 3D images in the application is less important compared to the number of mobile users who are able to use the application. Compromising 3D for 2D graphics and having the graphics scaled down would be more desirable than having the application being incompatible on most mobile devices. If in the event that the application does not work on a user's mobile device, participants thought that users would rather be excluded from the campaign than to have downloaded the application to find out that it does not work on their mobile devices.

Participants stressed that usability is important so not to frustrate users. The application has to work flawlessly by being easy to use for the average user. Similar to a consumer digital camera, the technology has to be transparent to the users. It is crucial for the application to work seamlessly.

As a result of the focus group discussion, two ideas were proposed to keep the audience interested and excited. One of the ideas was to use the technology differently every time. Another was to provide incentive for users to use the application in the form of entertainment, story development, competitions, or special deals.

### 3.2.2.8 Unsolicited Comments and Discussions

The Mobile AR demonstration gave participants a taste of what is to come and left them expecting more. However, the use of the application requires a lot of effort as users have to actively participate. For mobile AR to be an effective marketing tool, participants in the focus group believed that it had to be interactive and provide a sense of unpredictability. The applications must also be achievable in a practical time frame and be easily accessible. Marketing with this technology could possibly be carried out in malls, trains, planes, and stadiums, mainly in places where crowds gather.

### ***3.2.3 Conclusion/Discussion***

As a marketing tool, mobile AR appears to have the ability to attract attention, particularly with male audiences who are interested in technology. This however, can inadvertently limit the target market to one specific demographic and psychographic group.

However impressive mobile AR technology may be, it is important to note that the content of the advertisement is more important than the technology itself. Focus needs to be put in developing the content of the advertisement instead of relying on the technology to create an impression. This can be done through creating a sense of suspense or delivering some sort of emotional experience. There must always be a purpose for users to initiate the use of mobile AR and to maintain interest. Moreover, the technology behind mobile AR must be transparent so that the average user will be able to utilise the application without frustration. Making the use of the technology transparent will increase the size of the market group by being able to reach more users.

The suggestion for using mobile AR on plane magazines also leads to the possibility of using the technology as a mail order catalogue application. The use of mobile AR would allow customers to visualise the products in 3D, as proposed by Zhang, Navab and Liou (2000).

Early use of the mobile AR marketing tool suggests a high level of involvement is required for the consumers to participate in these types of campaigns. Contrary to initial expectations, graphics quality or the use of 3D were of little concern to the participants. Participants were more concerned with the ease of use of the technology than initially anticipated.

Utilising mobile AR to its fullest potential as a marketing tool requires an in-depth understanding of what mobile 3D and interactivity can offer to the marketing industry that other types of media are unable to deliver.

### 3.3 INTERVIEW

#### 3.3.1 Methodology

A face-to-face interview was conducted on 12<sup>th</sup> May 2009 with the world leader in mobile augmented reality advertising (CEO of a mobile technology provider company in New Zealand)<sup>1</sup>. The purpose of this interview was to identify concerns relating to the mobile advertising industry from a technology provider's perspective.

The company interviewed is well known in the advertising industry for providing mobile technology and mobile content. The interview was conducted at the company's premises and ran for approximately 50 minutes. An open ended format was adopted in the interview, which offered the interviewee the ability to provide any information deemed important to the development of industry and the company. The only explicit question asked in the interview was:

*“What is your company really interested to know that would help your company and the industry in terms of research in marketing?”*

The interview progressed through 1) advertising industry structures, 2) how agencies are rewarded, 3) the practice of scam advertising, 4) changes in the advertising industry and 5) interest from a mobile agency's perspective.

The results from this interview contributed to the formation of the core research framework. A summary of the points raised in the interview can be found in Table A.3b of Appendix One.

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<sup>1</sup>CEO of the company that introduced mobile AR advertising and the only company in the world at the time making mobile AR advertising.

### **3.3.2 Results**

#### **3.3.2.1 Advertising Industry Structure**

The advertising industry is a well structured industry that operates through specific channels. This structure is referred to as ‘the advertising industry structure’. In it, a company (referred to as ‘brand’ by the interviewee) appoints an ‘agency of record’ that is authorised to purchase media time and space on behalf of the advertiser, and to work with a network of different advertising agencies to produce different elements of the advertising strategy. These network agencies consist of different specialist agencies that are granted the rights to publish in different media such as print, television, radio, digital and outdoor media by the agency of record. However, mobile advertising does not currently have a place in the industry structure. The industry structure is a complex system where different agencies pitch their own ideas and have exclusive rights to publish in their allocated media space. The decision making process in each level within the industry structure inevitably exerts huge influence on the advertisement outcome that determines the consumer experience. Hence, there is a need to understand the industry structure. The advertising industry is also strongly network orientated since participants are often paid based on performance and require support from other complimenting agencies to produce evidence of success.

As a result of the recent economic recession, an increasing number of agencies are now describing themselves as 360 agencies. These 360 agencies cover all the different aspect of advertising and have the right to engage brands directly without going through an agency of record. Figure 3.a shows the advertising industry structure.

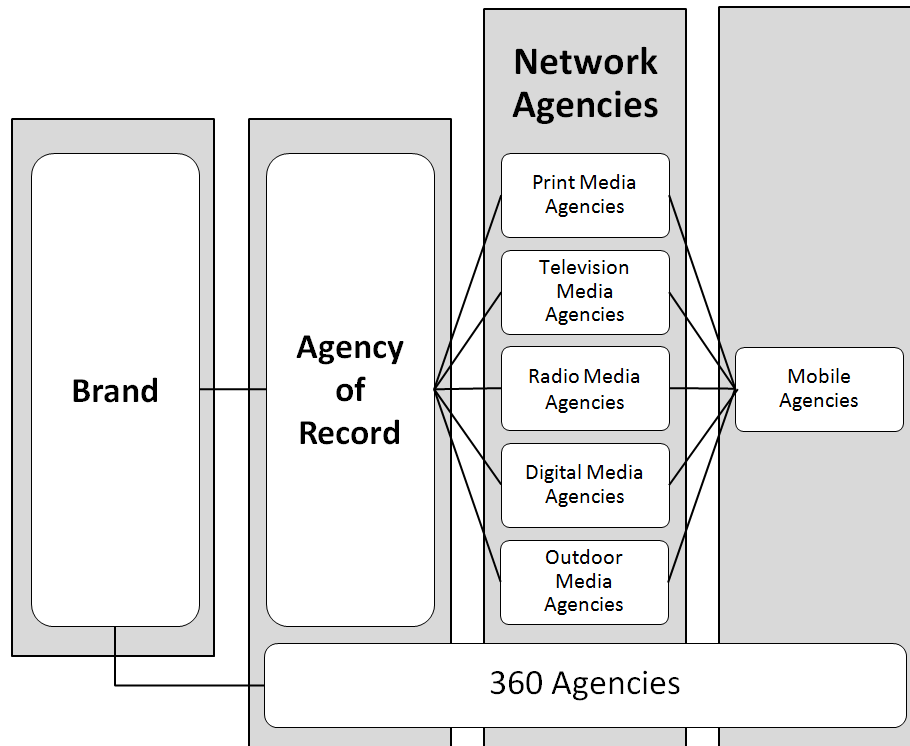


Figure 3.a: Advertising Industry Structure

### 3.3.2.2 Reward

Agencies of record are paid based on the percentage of the total amount spent on media. This is usually 15% of the total media spent. Creative agencies are paid approximately 10% of the total advertising budget for producing work. This distribution of budget is the traditional structure generally adopted across the advertising industry. When it comes to mobile advertising, rewarding work on developing content becomes unclear. Mobile advertising development does not fit into the traditional structure of 90% of budget spent on media and 10% on production. Hence a lot of advertisers struggle with the idea of building brands and applications in mobile advertising.

Interactive agencies that generally work on websites are usually rewarded based on CPI/CPM (cost per thousand impressions) or CPC (cost per click-through). Viral advertising on YouTube for example, provides a great way to identify the number of users who view an advertisement; however, the information on total number of views does not necessarily reflect those viewed by the target audience. Ultimately, brands are only concerned with increasing sales. It is also hard to claim that large viewing

audiences will result in an increase in sales as this is, as the interviewee puts it, “a huge leap in terms of cause and effect”.

The value of an advertisement can be measured by its reach and depth. As explained by the interviewee, reach describes the total number of different individuals exposed to the advertisement or the total number of unique views, while depth describes the retention of information from the advertisement viewing experience. Despite the vast number of computer and mobile users, reach is arguably not the main strength in digital media. The ability of digital media to distribute targeted content to users makes depth a far superior measurement for the value of an advertisement. According to the interviewee, there is a general consensus in the industry that reach is a traditional measure for the success of mass media advertisement campaigns and should not be used as a measure for the success of mobile campaigns. A measure of depth should instead be used. Unfortunately, there is still no straightforward way for measuring information retention in the practical environment.

#### 3.3.2.3 Practices of Scam Advertising

A well known problem in the advertising industry is the relatively widespread practice of scam advertising. Scam advertising occurs when advertising agencies produce advertisements that do not deliver any value to the clients, but are instead solely focused on obtaining recognition for the agency itself. This practice is not helped by the many different awards (awards that are used to reinforce the agency’s portfolio) offered in the advertising industry, which inadvertently motivate agencies to produce scam advertisements. Often, new technologies are used as a basis for scam advertising because of their novelty effect, which conveys a sense of innovation.

#### 3.3.2.4 Changes in the Advertising Industry

The advertising industry structure evolves and adapts to the industry environment. One noticeable reason for shifts in this structure is that advertisers now understand the potentially detrimental implications to the brand for adhering to the traditional advertising industry structure. Consequently, many brands no longer want the delivery of their message to consumers to be constrained by the current advertising industry



structure. Brands are also realising that an industry structure that allows individual agencies to pitch different messages across different media may not be beneficial to their brand. The focus is now on more control of cross-media strategies in order to deliver a consistent message across all media.

Interactive media is still relatively new in the advertising industry. It is better known for its importance as an online media than for its mobile potential. Since mobile agencies sit outside of the industry structure, they tend to be regarded as service providers with no specific channel to work in, making it difficult to attract budget for developing mobile advertising campaigns. To obtain budget for development on mobile platforms, mobile agencies have to work with creative agencies or 360 agencies. Mobile content providers also have to work with media companies, creative agencies and network agencies at all levels, while service providers distribute the content to consumers. Mobile media is typically deployed through a digital port and because of the mobile nature of the delivery device; it offers considerable potential for cross media advertising. Based on the traditional advertising industry structure, employing cross media advertising requires working with different media agencies that have exclusive rights to publish in their allocated media space. However, billboard or outdoor advertising agencies have a very personal structure and often lack digital expertise; hence there is a lack of cooperative initiatives between the two. This creates an issue as the outdoor agencies have the budget and sole rights to carry out outdoor campaigns. Recently, the advertising industry structure has been challenged by mobile agencies, with mobile content providers working towards having more direct relationships with brands.

#### 3.3.2.5 Interest in the Industry

As mobile advertising is still in its infancy, little is known about its potential and role in the advertising industry. In order for mobile advertising to be accepted as a significant advertising medium, it is important to demonstrate that mobile technology provides some form of value to the brand through either an increase in profitability or through retained brand value potential. Such a demonstration could be obtained through understanding the elements that would increase message retention, such as audio

feedback, 2D versus 3D images, expected versus delivered content, and the effects of real time experience or animated frame rates that contribute to the user experience.

Another element of interest in advertising is brand message orientation. The traditional advertising structure that allows different agencies to work independently in different media can result in a problem with brand message congruency. A brand message can either be in congruence with other brand messages within the brand, or fragmented, seen as different from the perceived understanding of the brand. Since advertising on the mobile platform could be attached to a perceived high-tech image, it is important to understand whether shifting the consumer's perception of a brand or reinforcing the brand message would deliver a favourable outcome.

Understanding the difference in viewing experience between mobile advertisements and other forms of advertising should provide a good understanding of where mobile advertising stands in the industry. The demographic characteristics of mobile media consumers, who it attracts, and who it is most effective with, would also be of value to the mobile advertising industry, as it would help identify the demographic and psychographic groups mobile campaigns are targeting. While technology will continue to evolve, needs and experience from both consumer and brand perspective will remain the same. Hence, it is more desirable to understand the creative and consumer behaviour forces that make mobile technology effective in advertising.

### ***3.3.3 Conclusion/Discussion***

The interview identified fundamental concerns regarding the structure of the industry and the ambiguity surrounding the effect of using mobile technology in advertising.

Industry practice resulting from the structure of the advertising industry has created an environment where advertisers are at a disadvantage and creating cross-media advertising is a challenge. However, the industry is correcting itself through the pressure generated from the advertisers on the industry as they recognise these structural concerns.

Despite the focus on mobile advertising in the interview, most concerns expressed appeared to be general concerns relevant to all advertising media. These included the user experience effect generated from a multi-sensory stimulus and the effect due to the congruency of brand message across different media.

There is also a need to identify a reliable and practical measure of message depth to gauge the success of digital advertising. A reliable and practical measure will perhaps provide a bridge to connect the effectiveness of a digital campaign to the increased value for the brand.

### **3.4 CHAPTER SUMMARY**

The two qualitative studies reported in this chapter have provided valuable information concerning the interest of both consumers and the advertising industry in mobile AR advertising. These concerns were centred on an understanding of consumer behaviour as it affects the use of mobile technology in advertising.

In both the focus group and the interview, interactivity was identified as a crucial component in digital advertising. Interestingly, the technology itself was not a factor that was deemed important by either the consumer group or the technology provider. Instead media content that contribute towards the user experience was found to be of most importance.

Seven potential research interests were identified from the focus group report. They were 1) *product involvement*, 2) *buyer decision stages*, 3) *informativeness*, 4) *effect of vividness*, 5) *attitude toward the advertisement*, 6) *gender effect* and 7) *novelty effect*. The interview report identified two potential research interests. They were 1) *identify potential practical measure of depth in advertisements* and 2) *behavioural attitudes*.

The findings from this chapter will be use to create a research framework through understanding of the practical issues surrounding real world application of mobile media in advertising.

## Chapter Four: **CONCEPTUAL MODEL**

### **4.1 INTRODUCTION**

The purpose of this chapter is to introduce the conceptual model and present the proposed relationships that will be tested in this study.

Chapter Four will first introduce the conceptual model followed by presentation of the research hypotheses. Each hypothesis will be accompanied by relevant literature discussing the significance of the proposed relationship.

### **4.2 CONCEPTUAL MODEL**

The literature review in Chapter Two and qualitative study reported in Chapter Three have provided an in-depth understanding of mobile advertising and the industry. The information obtained from understanding the concerns of users and the industry from Chapter Three forms the rudimentary conceptual framework of the conceptual model in Figure 4.a. This section will provide an overview of the relationships to be studied, before they are discussed in depth in the research hypotheses section.

The proposed conceptual model predicts that mode vividness of the advertisement has an effect on the amount of time users spend on viewing the advertisement. Time viewing the advertisement in turn, will affect a user's level of information recall and brand recall. Vividness is also predicted to affect a user's perceived informativeness of the advertisement and the user's attitude toward the advertisement. Attitude toward the advertisement will then have an effect on attitude toward the brand and brand recall. All the relationships mentioned above are affected by the type of product presented in the advertisement, manipulated through product involvement, and the consumer's goal, manipulated through specific stages of the buyer decision process.

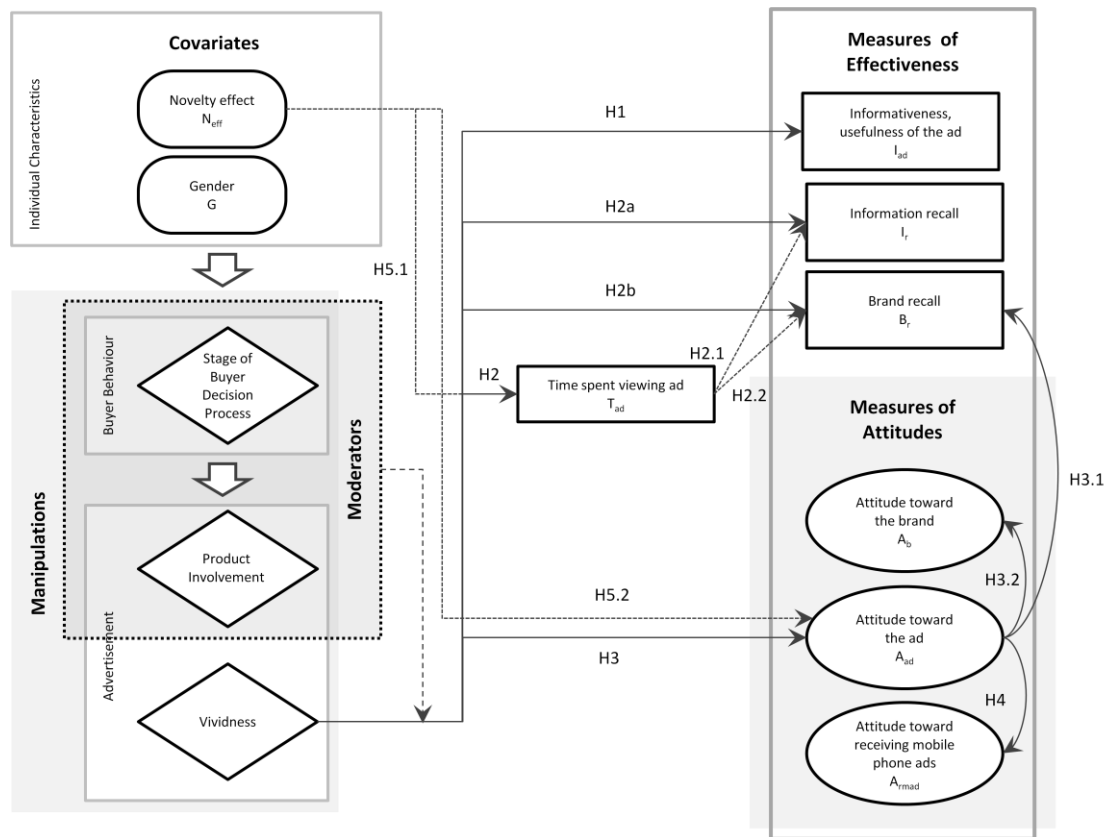


Figure 4.a: Proposed conceptual model

## 4.3 RESEARCH HYPOTHESES

### 4.3.1 Effects of Vividness, Product involvement, and Stage of Buyer Decision Process

**Vividness-** The effects of advertisement vividness in traditional media generally focuses on message and image vividness, referred to as content vividness, and is well studied (Frey & Eagly, 1993; Kisieliuss & Sternthal, 1984, 1986; McGill & Anand, 1989; Taylor & Thompson, 1982). Research on advertisement vividness in digital media is still relatively new, especially in terms of advertising using mobile digital media. A study by Coyle and Thorson (2001) found that participants who saw websites that display high vividness developed stronger attitudes toward the websites than those who saw medium or low vividness sites. The ability to produce advertisements on a mobile digital platform allows creative content providers to exploit the available technology and produce a greater degree of vividness in their advertisements. Having the ability to create a highly variable degree of vividness in mobile advertising makes understanding its effect on consumer attitudes of both theoretical and practical value.

***Product involvement*** - Participants in the focus group as reported in Chapter Three indicated the types of product they could see being advertised on AR advertisements. This prompts the question whether all types of products are suitable to be advertised on mobile phones with different degrees of vividness. Understanding the characteristic of products that are suitable to advertise using different vividness in mobile phone advertisements, would allow advertisers to decide whether to include the type of mobile advertising as part of their advertising campaign strategy. The effect of advertising on high or low product involvement has been well studied, with numerous researchers finding product involvement to be an important factor when it comes to determining the effectiveness of an advertisement (Asadollahi, 2011; Dens & Pelsmacker, 2010; Radder & Huang, 2008; Torres & Briggs, 2007). A study of mobile advertising by Drossos and Fouskas (2010) found that participants had a less favourable intention to purchase when receiving an SMS advertisement concerning a high involvement product. Therefore, it is important to include product involvement in any study of mobile advertising.

***Stages of buyer decision process*** -It is well known that consumers exhibit different behaviour when in different stages of the buyer decision process (Kotler & Armstrong, 2008). Nevertheless, little is known about the effect advertising has on the consumer when they are engaged in different stages of the buyer decision process. Researchers have generally focused on purchase intention as the ultimate measure for the effectiveness of an advertisement; however, purchase intention may not be the most accurate measure when consumer goals or intentions differ depending on their stage in the buyer decision process. Measures of attitude toward the advertisement and attitude toward the brand that take in account the different stage a consumer is in within the buyer decision process may alternatively present a better measure of success as they are in line with the purpose of the advertisement, that is, to inform, remind and persuade through the different stages of the buyer decision process.

#### ***4.3.2 Effects on Informativeness***

Informativeness, as used by Oh and Xu (2003), is the ability to effectively provide relevant information. Consumers believe that information is a major benefit from being exposed to advertisements (Bartons & Dunn, 1974; Bauer & Greyser, 1968), while studies have identified informativeness as a positive contributing factor in the perceived

value of advertising in general (Ducoffe, 1995, 1996; Eighmey, 1997; Gao & Koufaris, 2006). This factor has also been found to be highly influential in consumer choice behaviour (Berdie & Hauff, 1986, as cited in Lohse, 1997). A recent study by Blanco et. al. (2010) has found that information perceived by consumers in mobile advertising affects the consumers' attitudes, hence reinforcing the value of informativeness as a construct that is important in determining the effectiveness of advertising.

Instead of looking at informativeness as a mediator for attitudes, this thesis will look at the effectiveness of different degrees of vividness in delivering relevant information from the brand's perspective. To achieve this, the thesis proposes that there is a relationship between Vividness and Informativeness; however, this relationship is influenced by both product involvement and the consumer's goal based on their stage within the buyer decision process. Hypothesis One proposes that:

*H1. Vividness has an effect on Informativeness in different Stages of Buyer Decision Process and different levels of Product Involvement.*

#### ***4.3.3 Effects on Time Spent Viewing Advertisement***

A study by Bezjian-Avery et al. (1998) provided a preliminary indication that time spent viewing an advertisement could be used as a measure of the effectiveness of the advertisement. Their study suggested that an increase in time considering the advertisements can enhance persuasion to purchase intention for visual-orientated individuals. They also found that participants spent more time looking at products with highly visual advertisements. Lohse (1997) pointed out that time spent viewing advertisements does not only indicate attention, but may also suggest consumer preferences.

Unlike behavioural attitudes that require complex measurements to gauge the effectiveness of an advertisement, time viewing an advertisement can be easily measured through indirect digital data acquisition. The potential use of time viewing an advertisement as an indirect measure of depth in advertising effectiveness makes it an element of interest in this study.

This thesis proposes that there is a relationship between Vividness and Time Spent Viewing the Advertisement; however, this relationship is influenced by both product involvement and the consumer's goal. Hypothesis Two proposes that:

*H2. Vividness has an effect on Time Spent Viewing Ad in different Stages of Buyer Decision Process and different levels of Product Involvement.*

#### **4.3.4 Effects on Recall**

Recall is a widely adopted measure for effectiveness in advertising, obtained by measuring the level of information retained by consumers directly from the viewing of the advertisement. Longer scenes in advertisements have been associated with improved information recall (Rossiter, Silberstein, Harris & Nield, 2001). Studies of television viewing have found that the longer a person views an advertisement, the more information they tend to retain (Krugman, Cameron & White, 1995; Swallen, 2000). Danaher and Mullarkey (2003) established that an increase in the duration of time that a person remains on a particular web page increases their likelihood of remembering an advertisement on the page.

The construct of recall can come in the form of contextual (advertisement message) information recall or recognition such as brand recall. Singh and Rothschild (1983) suggested that information recall is more appropriate for measuring the effectiveness of high-involvement products whereas recognition may be sufficient for low-involvement products in advertising. Hence, hypothesis 2.a and 2.b proposes that:

*H2a. Vividness has an effect on Information Recall in different Stages of Buyer Decision Process and different levels of Product Involvement.*

*H2b. Vividness has an effect on Brand Recall in different levels of Product Involvement.*

Hypothesis 2.1 and hypothesis 2.2 propose that there is a relationship between time spent viewing an advertisement on a mobile phone with information recall and brand recall.



*H2.1. There is a relationship between Time Spent Viewing the Ad with the level of Information Recall.*

*H2.2. There is a relationship between Time Spent Viewing the Ad with the level of Brand Recall.*

#### ***4.3.5 Effects of Attitude Towards the Advertisement***

Studies have found that consumers generally have negative attitudes toward advertisements (Zanot, 1981, 1984), even more so when it comes to mobile advertisements (Blanco & Blasco, 2010; Tsang, Ho & Liang, 2004). The effect of vividness has been credited to the formation of attitude towards the advertisement and attitude towards the brand in an experiment comparing advertisements with less concrete picture (less vivid) and advertisements with more concrete picture (more vivid) imagery (Mehta & Purvis, 1995). Researchers have also shown that animated banner advertisements with higher vividness generated higher recall, more favourable attitude toward the advertisement, and higher click-through intentions compared to static advertisements (Yoo et al., 2004).

Attitude toward the ad ( $A_{ad}$ ) is defined as a "pre-disposition to respond in a favourable or unfavourable manner to a particular advertising stimulus during a particular exposure occasion" (Lutz, 1985, p.46). The construct has been widely accepted as a good indicator of advertising effectiveness where a significant relationship has been suggested linking attitude towards the ad with purchase intention (Brown and Stayman, 1992). Researchers have studied the attitude towards the ad construct in explaining changes in consumer brand beliefs, brand attitude, and purchase intentions (Mackenzie et al., 1986; Shimp, 1981). Therefore, the first part of hypothesis Three proposes that:

*H3. Vividness has an effect on Attitude Toward the Ad in different Stages of Buyer Decision Process and different levels of Product Involvement.*

The second part of hypothesis Three looks at the relationship between attitude towards the ad with attitude towards the brand and brand recall.

Attitude towards the brand is an important construct from a managerial perspective where companies are interested in improving their brand relationship with consumers through advertising. A number of researchers have shown that attitude toward the ad has a strong relationship with attitude toward the brand (Gardner, 1985; Homer, 1990; Mitchell, 1986; Muehling & Lacznia, 1988; Stayman & Aaker, 1988). Similarly, the level of recall of the brand has been found to be strongly related to attitude toward the ad (Zinkhan & Fornell, 1989). Therefore, hypotheses 3.1 and 3.2 propose that:

*H3.1. There is a relationship between Attitude Towards the Ad and Brand Recall.*

*H3.2. There is a relationship between Attitude Towards the Ad and Attitude toward the Brand.*

Another interesting construct from a managerial perspective is a consumer's attitude toward receiving mobile phone advertisements. Understanding of this construct will allow advertisers to identify the type of advertisement that is generally better accepted by consumers, consequently enabling better advertising penetration. This thesis proposes that by increasing the attitude toward the ad through manipulation of advertising vividness, advertisers will be able to increase consumer attitude toward receiving the type of mobile phone ad. Hypothesis Four proposes that:

*H4. There is a relationship between Attitude Toward the Ad and Attitude Toward Receiving Mobile Phone Ad.*

#### **4.4 COVARIATES**

In addition to the variables outlined in the conceptual model, three covariates identified in this study will also be examined.

#### **4.4.1 Gender**

The first covariate is gender. Gender has been determined to be a significant factor in a wide range of studies. These studies include the Technology Acceptance Model (TAM) theory, that models how users accept and use a technology (Gefen & Straub, 1997; Venkatesh & Morris, 2000; Yang, 2005). Vividness in mobile advertising as outlined in this thesis depicts similarity with technology adoption due to the way in which the advertisements are presented using different delivery methods through the use of technology. A prior study on mobile commerce found that male respondents tend to perceived mobile commerce more favourably than their female counterparts (Yang, 2005). Men have also been found to be more influenced by their attitude toward using new technology than women (Venkatesh et al., 2000). Therefore it is believed that different genders will process advertisement vividness differently in mobile advertising.

#### **4.4.2 Advertisement Novelty**

The second covariate is novelty. The novelty effect has also been studied in the Technology Adoption Model (Jackson et al., 1991; O'Cass & Fenench, 2003; Venkatesh & Morris, 2000). A study by Edwards and Gangadharbatla (2001) of websites that depicted both 3D products and non-3D products found that novelty had an effect on attitude toward the websites. Novelty stimuli were found to shape purchase intention (Edwards & Gangadharbatla, 2001) as well as stimulating information processing, thereby improving recall and recognition when compared to non-novel stimuli (Fahy, Riches & Brown, 1993; Li, Miller & Desimone, 1993; Riches, Wilson & Brown, 1991; Wilson & Rolls, 1993). Conversely, novelty stimuli have also been found to create a negative impact on recall where highly novel analogies in advertisements were found to be too complex for interpretation, resulting in reduced ability to integrate information (Fitzgerald, 1999). There is clearly evidence indicating that novelty will affect the outcome on this study and must be included as a covariate. Therefore, Hypothesis 5.1 and 5.2 proposes that:

*H5.1. Novelty has an effect on Time Spent Viewing Ad.*

*H5.2. Novelty has an effect on Attitude Toward the Ad.*

#### **4.5 CHAPTER SUMMARY**

This chapter has presented the conceptual model that will be used in this thesis. Research hypotheses were presented and discussed in detail, supported by relevant literature. Covariates proposed to be significant to this study were also identified and discussed.

The following chapter will lay out the methodology by which the hypotheses presented in this chapter will be tested.

## Chapter Five: **RESEARCH METHODOLOGY**

### **5.1 INTRODUCTION**

Chapter Five lays out the complete research methodology employed for this study. It begins by describing in detail the experimental design, followed by a description of the experimental variables, questionnaires, reliability tests, and the experimental procedures. Prior to conducting the main experimental research, a pre-test was carried out to address three main concerns - the reliability of the questionnaires, potential bias in the experimental design, and the robustness of the online questionnaire system.

#### ***5.1.1 Main Experiment***

The main experiment had 288 participants; this number was specifically chosen to account for all the permutations in the mixed design, which is discussed in section 5.2.1. Students were again recruited from across the University of Canterbury to form the experimental sample group. Each participant was given an incentive of a NZ\$5 grocery voucher and a 1-in-288 chance of winning an iPod Touch.

Recruitment emails were sent out to university students with the assistance of law, psychology, science, history and management departmental administrators. Emails were sent out in batches since only a maximum of 16 experimental runs could be conducted per day due to the time required to run each experiment. Posters were also displayed throughout the university in an effort to obtain a cross section of university students from all departments. Potential participants were directed to an online time booking system which also specified the location of the experiment. A room in the Commerce Building of the University of Canterbury was set up to carry out the experiment in order to maintain a consistent experimental environment.

The main experiment was conducted from 3<sup>rd</sup> June to 13<sup>th</sup> August 2010. Each participant was allocated a 30-minute time slot between 9am and 5pm during the weekdays. There were 319 people who registered to participate in the experiment, out of which 31 participants (20 female, 11 male) did not turn up for the experiment. A total of 144 hours was spent on carrying out the experiment.

## 5.2 EXPERIMENTAL DESIGN

### 5.2.1 Mixed-Design

The experiment consisted of a 4x2x3 factorial experimental design of *Stages of Buyer Decision Process* x *Product Involvement* x *Vividness* (Figure 5.a).

***Stages of Buyer Decision Process (SBDP)***- Traditionally, five stages of the buyer decision process are recognised, consisting of Need Recognition, Information Search, Evaluation of Alternatives, Purchase Decision, and Post Purchase Behaviour (Kotler & Armstrong, 2008). However, this thesis will only address the first three pre-purchase behaviours, as conditioning or role playing Purchase Decision makes redundant the purpose of advertising, and Post Purchase Behaviour requires a user to have already undertaken the purchasing task (see Section 5.5.3). For the purpose of this thesis, the acronym SBDP and the term “*Different Stages of Buyer Decision Process*” will refer only to the three pre-purchase stages of the buyer decision process.

***Product Involvement*** - Product Involvement was categorised into low and high involvement products. Choice of representative high and low involvement products were based on Kotler and Armstrong’s (2008) categorisation conditions that is most relevant to the commercial industry. A low involvement product was described as available off the shelf which does not require substantial sums of money or a longer purchasing process, while a high involvement product was described as a product that required commitment of substantial sums of money and a longer purchasing process. Emphasis was placed on what the advertisers can control and not from the consumer’s perspective.

***Vividness***- For the purpose of this research, Vividness was defined as the richness of delivery mode (Mode Vividness) where the advertisement is delivered to users in terms of visual complexity. Mode vividness is best described by Steuer (1992, p.11) in the context of a mediated technology environment where “*Vividness means the representational richness of a mediated environment as defined by its formal features, that is, the way which an environment presents information to the senses*”. In Steuer’s

definition of vividness, vividness is made out of two components, sensory *breadth* described by the number of senses being stimulated and sensory *depth*, the “quality” or amount of information being delivered to the senses (Steuer, 1992). In this research, Mode Vividness was conceptualised from a technical perspective, based on the available means of delivering advertisements to mobile phones (*sensory depth*).

Different Degrees of Mode Vividness were simulated by:

- *Low Mode Vividness*- two dimensional information, depicted by a static image of an object
- *Medium Mode Vividness* - three dimensional information depicted by a 3D view of an object in a video mode and
- *High Mode Vividness* - four dimensional information depicted by 3D view of an object in augmented reality where the fourth dimension is in the freedom of time manipulation during the viewing of the object.

Mode Vividness was chosen for this study because advertisers have the ability to control this form of vividness. Only the visual component of the advertisements were presented in the experiment as it was felt that introducing an audio component would be impractical for advertisements that were to be viewed in a noisy outdoor environment. Visually analogous advertisements were chosen across the three different advertisement types to minimise the effect of confounding variables such as background colour, font colour, font type, and font size. These characteristics have been shown to affect the effectiveness of the advertisement (Dominique, Hanssens & Burton, 1980).

A complete between-subject 4x2x3 factorial design would require 720 participants to achieve an acceptable number of participants in each cell for statistical analysis. As each experimental run required between 15 and 30 minutes to complete in the presence of the experimenter, the only viable solution was to adopt a mixed-design experiment. A complete within-subject design was also not a feasible solution due to the nature of the SBDP, that is, the buyer decision process consists of a series of sequential stages. Using within-subject design for the SBDP would create cross contamination between the conditioning variables. A complete within-subject design also would result in an overly lengthy experiment, thereby introducing the risk of participants losing interest and attentiveness in answering the questionnaire.

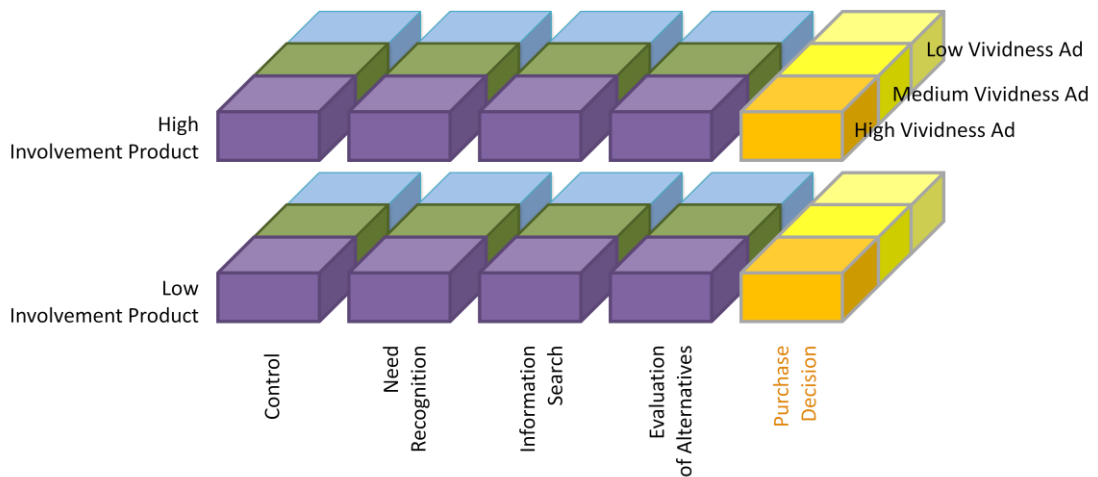


Figure 5.a: Experimental Design

The mixed-design chosen in this experiment consisted of a combination of between-subjects for the Product and SBDP variables and within-subjects for the Vividness variable.

### 5.2.2 Counterbalancing Order Effect

Counterbalancing was adopted to systematically vary the order of conditions for all possible permutations in Vividness. Calculation of the permutations for Vividness in each Product Type resulted in 36 order combinations for each pre purchase SBDP.

$$\text{Order Combinations } (36) \times \text{Product } (2) \times \text{SBDP } (4) = (288)$$

Therefore, the experiment required 288 participants to nullify the order effect. Three different Brands were introduced for each Product Type to differentiate the effect from the corresponding three levels of Vividness in the within-subject design.

It should be noted that every experimental run was different in its combination of sequence in which the advertisements were viewed, the Brand association to the advertisement, SBDP and Product Type. Table 5.a shows a generic example of SBDP. All four SBDP were subjected to identical experimental conditions.



Table 5.a: Experimental Conditions

| Product  | Brands<br>(PRODUCTbrand) | Media Vividness Level        | Media Type | Participant Counts |     |     |     |     |     | Total |
|----------|--------------------------|------------------------------|------------|--------------------|-----|-----|-----|-----|-----|-------|
|          |                          |                              |            | x6                 | x6  | x6  | x6  | x6  | x6  | 36    |
| <b>A</b> | Aa                       | Low Level Vividness (LLV)    | Image Ad   | LLV                | LLV |     |     |     |     |       |
|          |                          | Medium Level Vividness (MLV) | Video Ad   |                    |     | MLV | MLV |     |     |       |
|          |                          | High Level Vividness (HLV)   | AR Ad      |                    |     |     |     | HLV | HLV |       |
|          | Ab                       | Low Level Vividness (LLV)    | Image Ad   |                    |     | LLV |     | LLV |     |       |
|          |                          | Medium Level Vividness (MLV) | Video Ad   | MLV                |     |     |     |     | MLV |       |
|          |                          | High Level Vividness (HLV)   | AR Ad      |                    | HLV |     | HLV |     |     |       |
|          | Ac                       | Low Level Vividness (LLV)    | Image Ad   |                    |     |     | LLV |     | LLV |       |
|          |                          | Medium Level Vividness (MLV) | Video Ad   |                    | MLV |     |     | MLV |     |       |
|          |                          | High Level Vividness (HLV)   | AR Ad      | HLV                |     | HLV |     |     |     |       |
|          | Ad                       | Dummy                        |            |                    |     |     |     |     |     |       |
|          | Ae                       | Dummy                        |            |                    |     |     |     |     |     |       |
|          |                          |                              |            | Participant Counts |     |     |     |     |     | Total |
|          |                          |                              |            | x6                 | x6  | x6  | x6  | x6  | x6  | 36    |
| <b>D</b> | Da                       | Low Level Vividness (LLV)    | Image Ad   | LLV                | LLV |     |     |     |     |       |
|          |                          | Medium Level Vividness (MLV) | Video Ad   |                    |     | MLV | MLV |     |     |       |
|          |                          | High Level Vividness (HLV)   | AR Ad      |                    |     |     |     | HLV | HLV |       |
|          | Db                       | Low Level Vividness (LLV)    | Image Ad   |                    |     | LLV |     | LLV |     |       |
|          |                          | Medium Level Vividness (MLV) | Video Ad   | MLV                |     |     |     |     | MLV |       |
|          |                          | High Level Vividness (HLV)   | AR Ad      |                    | HLV |     | HLV |     |     |       |
|          | Dc                       | Low Level Vividness (LLV)    | Image Ad   |                    |     |     | LLV |     | LLV |       |
|          |                          | Medium Level Vividness (MLV) | Video Ad   |                    | MLV |     |     | MLV |     |       |
|          |                          | High Level Vividness (HLV)   | AR Ad      | HLV                |     | HLV |     |     |     |       |
|          | Dd                       | Dummy                        |            |                    |     |     |     |     |     |       |
|          | De                       | Dummy                        |            |                    |     |     |     |     |     |       |
|          |                          |                              |            | Total              |     |     |     |     |     | 72    |

LLV - Low Level Vividness

MLV - Medium Level Vividness

HLV - High Level Vividness

**A** - High Involvement product**D** - Low Involvement product

### 5.2.3 Products, Brands and Model

The decision to choose beer (Product D) and cars (Product A) as the two products used in the experiment was based on the assumption that both beer and cars are well advertised and consumed by the general population in New Zealand. These product choices were reinforced by Ratchford's (1987) report on product categorisation as shown in figure 5.b

**High Involvement Product** – Japanese imported car brands were used in this experiment. They were chosen as they fall in similar price ranges, relative affordability, relative reliability, and common Japanese import expectations. These similarities minimised any variable effects across the different car brands. The three brands chosen for the ads were Toyota, Mazda and Nissan. Two dummy brands, Mitsubishi and Honda were used for conditioning or role playing purposes in the SBDP of *Information Search and Evaluation of Alternatives*. An identical graphical model of a white, neutral

coloured car was used in all three types of advertisements. White colour was used to remove any affiliation of the advertisement to a specific brand of car.

**Low Involvement Product** – Well known and well advertised, locally made New Zealand beer brands were used to represent Low Involvement Product. Again, identical graphical models were used for all three types of advertisements to maintain consistency. The only difference between the models was the labels printed on the beer cans.

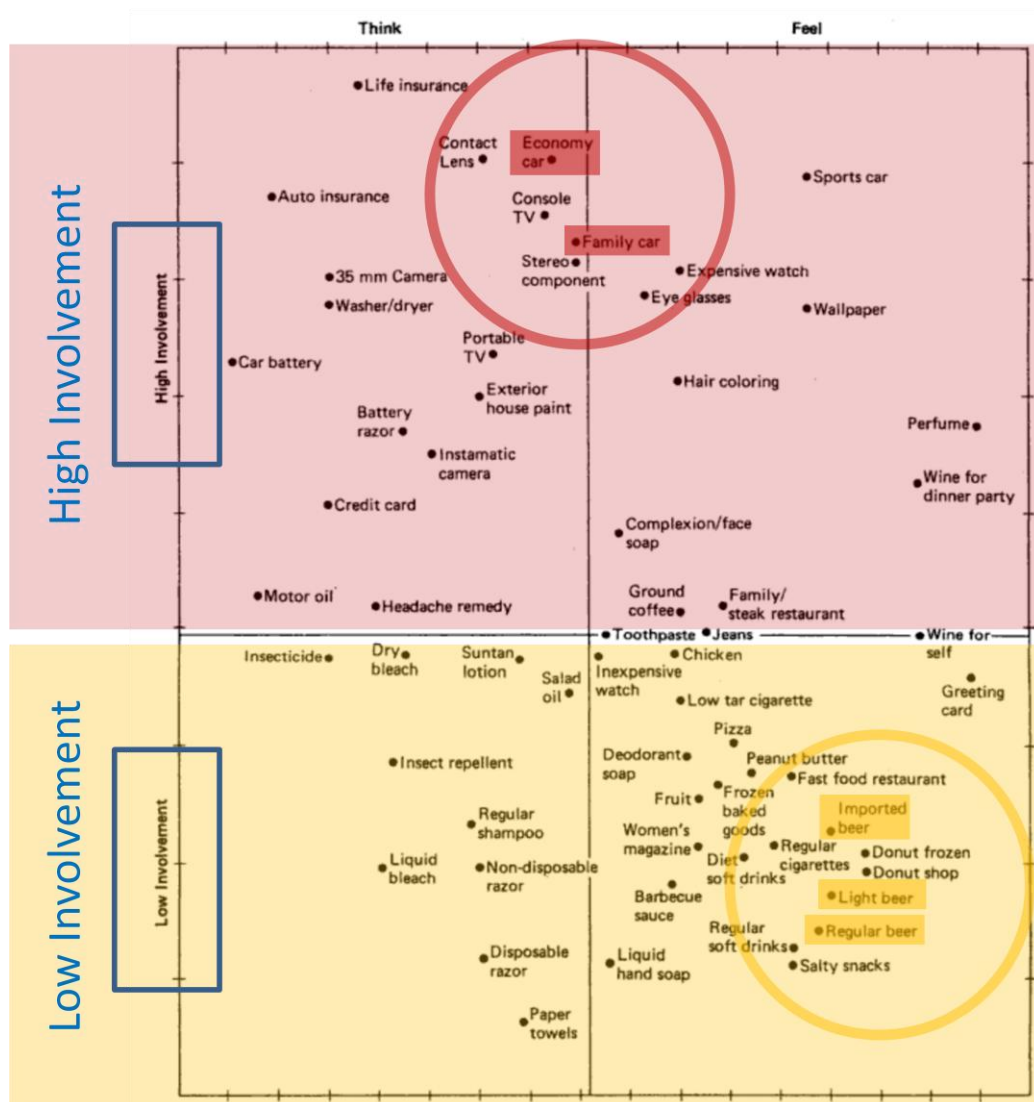


Figure 5.b: Foote, Cone & Belding (FCB) Grid for product categories as reported by Ratchford (1987) in Journal of Advertising Research.

Table 5.b: Products and Brands Used in Experiment

| Product          | Brand                       |
|------------------|-----------------------------|
| Car (Product A)  | Toyota (Brand <i>a</i> )    |
|                  | Mazda (Brand <i>b</i> )     |
|                  | Nissan (Brand <i>c</i> )    |
|                  | Honda (dummy)               |
|                  | Mitsubishi (dummy)          |
| Beer (Product D) | Speight's (Brand <i>a</i> ) |
|                  | Lion Red (Brand <i>b</i> )  |
|                  | Tui (Brand <i>c</i> )       |
|                  | Steinlager (dummy)          |
|                  | Export Gold (dummy)         |

#### 5.2.4 Mobile Phone Device

Delivering high vividness advertisements using Augmented Reality (AR) 3D graphics requires higher end mobile devices. The Nokia N95 was chosen for the reason that it was one of the most advanced mobile phone at the commencement of this thesis.

The prerequisites for an AR compatible device are: built-in camera, acceptable central processing unit (CPU) speed to provide a smooth image (preferably >300MHz), acceptable screen display size for ease of viewing and navigation (preferable >2.5 inches), acceptable screen resolution for viewing details on the ad (at least 240 x 320 pixels), and most importantly AR software that has previously been developed on the mobile phone operating system. Nokia N95 conformed to all prerequisites for an AR compatible device. The mobile device has a built-in camera, runs on Symbian, installed with a N-Gage gaming platform, has a high CPU speed of 332 MHz, has a 3D graphic HW Accelerator, good display resolution and colour range and a good screen display size of 2.7 inches. Table 5.c details the specifications for Nokia N95.

#### 5.2.5 Advertisement Details

Three different delivery modes - Image, Video, and AR were used to depict Low, Medium, and High Vividness of the advertisements. All Image, Video and AR advertisements for each product contained identical information printed with black text on a white, neutral background. Product price information in the advertisement was intentionally left out to avoid any effect from price.

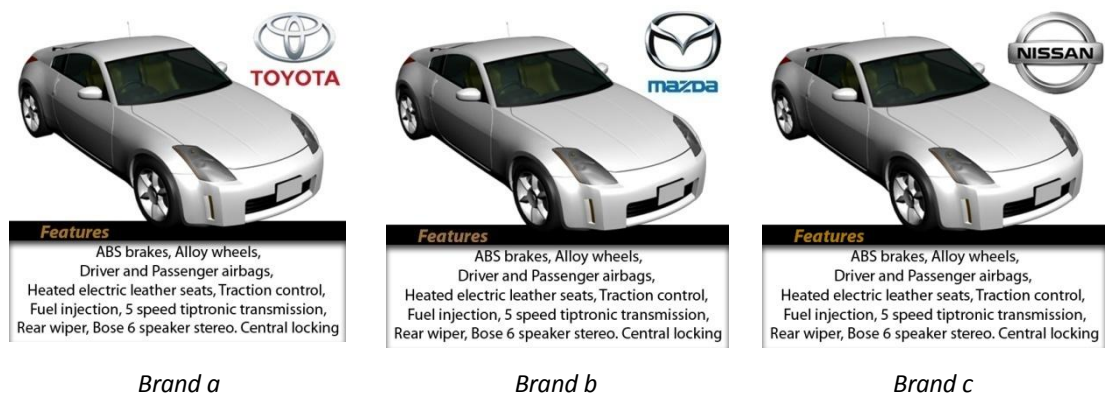
Table 5.c: Nokia N95 Specifications

|           |  |
|-----------|--|
| Announced | 2006, September. Released 2007, March  |
| Status    | Discontinued   |
| General   | 2G Network: GSM 850 / 900 / 1800 / 1900  |
|           | 3G Network: HSDPA 2100   |
|           | HSDPA 850 / 1900 - American version  |
| Size      | 99 x 53 x 21 mm, 90 cc, 120 g  |
| Display   | TFT, 16M colors, 240 x 320 pixels, 2.6 inches, 40 x 53 mm  |
| Sound     | Vibration; Downloadable polyphonic, monophonic MP3 ringtones, stereo speakers speakerphone, 3.5 mm audio jack  |
| Memory    | Practically unlimited entries and fields, Photocall, 160 MB storage, 64 MB RAM, microSD, up to 8GB, hot swap, 128 MB card included, buy memory   |
| Data      | GPRS, EDGE, 3G, WLAN, Bluetooth, Infrared port, USB.   |
| Camera    | 5 MP, 2592 x 1944 pixels, Carl Zeiss optics, autofocus, LED flash, Yes, VGA@30fps, QVGA videocall camera.  |
| Features  | OS: Symbian OS 9.2, S60 rel. 3.1   |
|           | CPU: Dual ARM 11 332 MHz processor; 3D Graphics HW Accelerator   |
|           | Messaging: SMS, MMS, Email, Instant Messaging  |
|           | Browser: WAP 2.0/xHTML, HTML   |
|           | Radio: Stereo FM radio; Visual radio   |
|           | Games: N-gage + downloadable   |
|           | GPS: Yes, with A-GPS support; Nokia Maps   |
|           | Java: MIDP 2.0   |
|           | Dual slide design, WMV/RV/MP4/3GP video player, MP3/WMA/WAV/RA/AAC/M4A music player, TV-out, Organizer, Document viewer (Word, Excel, PowerPoint, PDF), Push to talk, Voice dial/memo. |
| Battery   | Standard battery, Li-Ion 950 mAh (BL-5F)   |

**Image Advertisement** –All image advertisements were saved in 512 x 512 pixel resolution. Image Ads were in the form of a single static image. Beer image ads had the logo of the beer printed across the beer can and a logo on the top right hand corner of the Image Ad. Four descriptive points of the beer was provided under the information heading to reinforce that this was a low involvement product. The car image ad had a generic white coloured car with the car company logo printed on the top right hand corner of the Image Ad. Ten descriptive points about the car were provided under Features to reinforce that this was a high involvement product. The discrepancy in the number of descriptive points between high and low involvement products may arguably be considered a limitation of the experiment, however in this context it was done intentionally to further emphasis the difference between a high involvement product and a low involvement product. Figure 5.c shows the Image Ads used in the experiment.



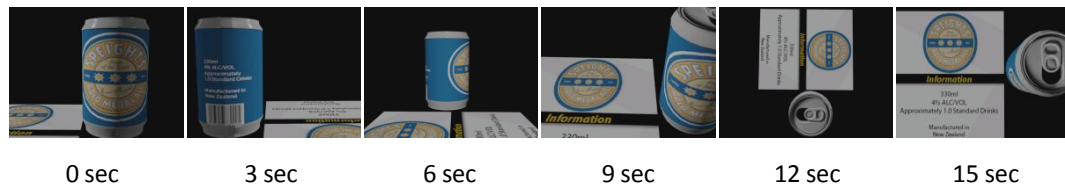
a. Image Ads for Beer(Product D)



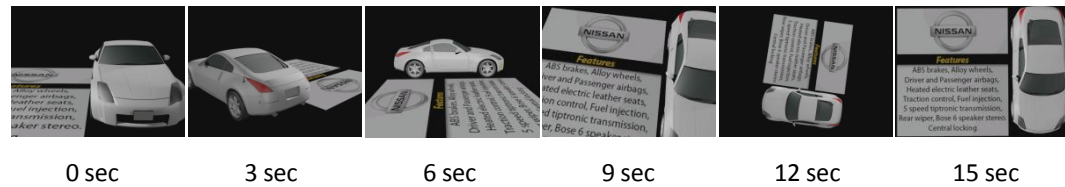
b. Image Ads for Car(Product A)

Figure 5.c: Image Advertisements

**Video** – All Video Ads created were 15 seconds in length. The video codec mp4 was used to create 640x480 pixel resolution videos with a frame rate of 15 frames per second. The Video Ad started with the front view of the model, rotated around the model and concluded by stopping at the top view of model with information about the product beside the model. The Video Ad provided participants with the ability to view around the model as the video progressed. Information provided in the advertisements was identical to that provided in the Image Ads. Figure 5.d shows samples of the Video Ads at intervals of 3 seconds.



a. Video Ad Sample for Beer(Product D)



b. Video Ad Sample for Car(Product A)

Figure 5.d: Sample Video Ads

**Interactive** – A marker with 5cm x 5cm in size was printed on a 15cm x 20cm cardboard and used for augmenting 3D AR ads in the real world. The car model was 30cm x 15cm in size and the beer can model was 10cm in radius and 20cm in height. Viewing the model was achievable by rotating the marker around or moving the phone around the marker. The Interactive Ad was effectively identical to the Video Ad except for the ability to interactively view the models. Again, information provided in the Interactive Ads was identical to those in the Image Ads and Video Ads. Figure 5.e shows samples of the Interactive Ads.



a. Interactive Ad for Car



b. Interactive Ad for Beer

Figure 5.e: Sample Interactive Ads

### **5.2.6 Software**

Having different forms of advertisements to represent Vividness meant that different software was required to display the advertisements.

**Image ads** – The Nokia N95 comes with software that allows viewing of image file formats such as JPG, BMP, GIF and PNG. No additional image viewing software was necessary for viewing image ads.

**Video ads** – The Nokia N95 also comes with a mobile version of Real Media Player. This media player allows the viewing of WMV, RV, MP4 and 3GP format video files. Again, installation of additional software was not required.

**Interactive ads** – The Interactive software or AR software was developed by Gu Jian (2008) as part of his Masters degree in Computer Engineering at the University of Canterbury. The software was developed on Nokia's N-Gage gaming platform. N-Gage is a mobile telephone and handheld game system based on the Nokia Series 60 platform. The free software was downloaded from [www.n-gage.com](http://www.n-gage.com) and installed onto the Nokia N95 phone. On October 30, 2009, Nokia announced that N-Gage service would cease at the end of 2010.

3D Studio Max was used to build, modify and optimise the 3D models of the car and the beer can for use on the Nokia N95 mobile phone. Photoshop was used to edit the images for the models.

### **5.2.7 Web Interface**

A web interface questionnaire was used to collect data from the experiment. Due to the complexity of the experimental design, a unique web interface was developed. Proprietary survey software was unable to deliver sufficient flexibility for the experimental design.

The web interface was written in php and stored on an open source MYSQL database. A web-based survey was able to provide a number of notable advantages when

compared to a paper-based counterpart. These advantages included ease of data recording, removal of possible data transfer errors, elimination of missing data and the ability for indirect data collection (described in Section 5.3.2). The web interface employed a combination of radio buttons, text boxes, and graphical slider bars. The radio buttons and text boxes were equivalent to their paper based counterparts whereas the graphical slider bar is unique to a web-based survey, as it implements JavaScript technology.

### **5.3 VARIABLES**

Seventeen variables were used in this experiment. Data were collected through *direct* and *indirect* data acquisition processes in the experiment, prior, during, and after viewing the advertisements. Table 5.d shows a list of all variables in the experiment. Most of the variables are self explanatory. Those that are not will be discussed further in this section.

#### ***5.3.1 Direct data acquisition***

For the direct data acquisition process, participants were asked to fill out questionnaires prior to the viewing of the advertisements and after viewing the advertisements.

#### ***5.3.2 Indirect data acquisition***

Indirect data acquisition is a process in which data are obtained by means of observation of behaviour, often through automatic data collection. Time spent on viewing the advertisement (automatic) and user manoeuvrability behaviour (observed) data were collected through indirect acquisition during the viewing of the advertisements.



Table 5.d: List of All Variables

|                                       | Variable Description  | Variable           |
|---------------------------------------|---|--------------------|
| <b>Independent Variables</b>          |   |                    |
| 1                                     | Vividness   | V                  |
| 2                                     | Product Involvement   | PI                 |
| 3                                     | Stage of Buyer Decision Process                                 | S <sub>BDP</sub>   |
| <b>Confounding Variables</b>          |   |                    |
| 4                                     | Initial attitude toward receiving mobile phone advertisements   | A <sub>rmADi</sub> |
| 5                                     | Initial attitude toward brands                                  | A <sub>bi</sub>    |
| 6                                     | Brand preferred   | B <sub>p</sub>     |
| <b>Dependent Variables</b>            |   |                    |
| 7                                     | Time spent viewing advertisement                                | T <sub>ad</sub>    |
| 8                                     | Information recall  | I <sub>r</sub>     |
| 9                                     | Brand recall  | B <sub>r</sub>     |
| 10                                    | Attitude toward the advertisement                               | A <sub>ad</sub>    |
| 11                                    | Informativeness, usefulness, functionality of the advertisement | I <sub>ad</sub>    |
| 12                                    | Final attitude toward receiving mobile phone advertisements     | A <sub>rmADf</sub> |
| 13                                    | Final attitude toward brands                                    | A <sub>bf</sub>    |
| <b>Calculated Dependent Variables</b> |   |                    |
| 14                                    | Change of attitude toward receiving mobile phone advertisements | $\Delta A_{rmAD}$  |
| 15                                    | Change of attitude toward brands                                | $\Delta A_b$       |
| <b>Covariates</b>                     |   |                    |
| 16                                    | Novelty effect  | N <sub>eff</sub>   |
| 17                                    | Gender  | G                  |

### 5.3.3 Independent Variables

Three independent variables were used in this experiment. These independent variables were 1) level of involvement of product (high or low), 2) level of vividness of ad (high, medium or low), and 3) stage of buyer decision process (need recognition, information search, evaluation of alternatives, and a control variable).

### 5.3.4 Confounding Variables

There were three independent variables collected through a series of initial questionnaires prior to the viewing of the advertisements. The independent variables collected were *brand preferred* (B<sub>p</sub>), *initial attitude toward receiving mobile phone ads* (A<sub>rmADi</sub>) and *initial attitude toward brands* (A<sub>bi</sub>). B<sub>p</sub> was the brand chosen by participants from one of two dummy brands in each product used in the conditioning or role playing scenario.

### 5.3.5 Dependent Variables

Data from dependent variables were collected after the viewing of the advertisements. Those data were collected through the use of questionnaires and automatic data collection. *Time spent viewing ad* ( $T_{ad}$ ) was collected automatically during the viewing of the advertisements. *Stages of Buyer Decision Process* ( $S_{BDP}$ ) and *information recall* ( $I_r$ ) were collected immediately after the viewing of each advertisement.  $S_{BDP}$  was used to measure if a participant progresses further in the buyer decision process through viewing of the advertisement while  $I_r$  records the amount of information obtained from viewing the advertisement. *Brand recall* ( $B_r$ ), *Attitude toward the ad* ( $A_{ad}$ ) and *Informativeness of the ad* ( $I_{ad}$ ) for each advertisement type were obtained through the first part of the final questionnaires after all the advertisements were viewed. *Final attitude toward receiving mobile phone ads* ( $A_{rmADf}$ ), *final attitude toward brands* ( $A_{bf}$ ) and *final attitude toward the mobile phone* ( $A_{mf}$ ) were later collected in the second part of the final questionnaire section. The second part of the questionnaire was designed to obtain information on *Brand recall* prior to obtaining information on *final attitude toward the brand*. This order was followed so that the effectiveness of the type of advertisement could be measured by the level of brand recall, without any interference from possible brand preferences.

### 5.3.6 Calculated dependent variables

Two additional dependent variables were calculated from the collected dependent variables. These variables were calculated to identify the change of attitude as a result of exposure to the experimental stimuli, in this case, the different advertisements.

***Change of attitude toward receiving mobile phone ads*** ( $\Delta A_{rmAD}$ )- *Change of attitude toward receiving mobile phone ads* is the difference between *final attitude toward receiving mobile phone ads* ( $A_{rmADf}$ ) and *initial attitude toward receiving mobile phone ads* ( $A_{rmADi}$ ).

$$\Delta A_{rmAD} = A_{rmADf} - A_{rmADi}$$

***Change of attitude toward brands, ( $\Delta A_b$ )*** - *Change of attitude toward brands* is the difference between *final attitude toward brands* ( $A_{bf}$ ) and *initial attitude toward brands* ( $A_{bi}$ ).

$$\Delta A_b = A_{bf} - A_{bi}$$

### **5.3.7 Covariates**

Two covariates were collected in this experiment. Those covariates were *novelty effect* ( $N_{eff}$ ) and *gender* (G).  $N_{eff}$  identifies whether the advertisement type was novel to the participant.

## **5.4 Detailed Questionnaires and Pre-test Reliability Test**

The experiment had three sets of questionnaires, identified as *initial*, *intermediate* and *final*. These three self-contained sections were used to capture specific data available at different stages of the experiment. In order to obtain a significant reliability test for the questionnaires, 20 participants were recruited from postgraduate students in the Department of Management at the University of Canterbury. Nine males and 11 females participated in the pre-test that was carried out from 14<sup>th</sup> May to 3<sup>rd</sup> June 2010. Numerous changes were made to the experimental design, the questionnaires, and the scripting of the questionnaires, addressing coding errors.

Notable changes made after the pre-test were:

1. Clearer definition of the different advertisements by introducing post ad viewing cue cards after each advertisement.
2. Clearer emphasis on the role playing scenario with role playing reminder statements.
3. Changes to the questionnaires to include additional options such as one that allow participants to choose the option 'not sure'.

A complete list of changes made to the experimental design can be found in AppendixTwo, Table A.5a. The respective reliability values of the variables used in the experiment for the pre-test are reported in section 5.4.1, 5.4.2 and 5.4.3, while those for the main experimental study are reported in Chapter Six.

### 5.4.1 Initial Questionnaire

The initial set of questionnaires was designed to collect data on *Attitude Toward Receiving Mobile Advertising*, *Attitude Toward the Brand* and *Brand Preferred* as shown in Table 5.f.

#### 5.4.1.1 Initial Attitudes

***Attitude toward receiving mobile advertising*** – The scale items were adapted from the scale of *Attitude Toward Advertising (Overall)* obtained from the Marketing Scales Handbook Vol. IV (2005). The scales consist 45 different scale items from different sources that measures a subject's evaluation of an advertisement. Seven out of the original scale items were chosen with the rest of the adjectives in the scales found not relevant to attitude toward receiving mobile phone advertising. Once again a 7-point summated rating scale was used. Descriptive statistics can be found in Table 5.e.

#### ***Reliability***

Reliabilities of alpha 0.69 and 0.98 were reported. The pre-test indicated that the questions were unidimensional and yielded a reliability alpha value of 0.97.

***Attitude toward brand*** – A slider bar graphical interface was used to allow participants to indicate their attitude toward different brands. The slider bars had a range of 1 to 100 with a step size of 1. The value (1) was anchored at *dislike the brand for this product*, (50) *neither like nor dislike* and (100) was anchored at *like the brand for this product*. A numerical value corresponding to the position of the slider bar was displayed beside each slider bar. The slider bar was used to allow participants to express their overall attitude toward the brand, at the same time, provide a relative attitude toward the different brands.

#### 5.4.1.2 Brand Preferred

***Brand preferred*** – Five different brands of each product were used in the experiment of which two were dummy brands. Participants were given the option to choose between the two dummy brands used for the role playing task that allowed the conditioning of participants to the required stage in the buyer decision process.

Table 5.e: Attitude Toward Receiving Mobile Phone Ad  $A_{rmAD}$ 

| Attitude Toward Receiving Mobile Phone Ad A <sub>rmAD</sub>             |  |                  |              |                                   |   |
|---|--|------------------|--------------|-----------------------------------|---|
| Please rate your view on receiving advertisements on your mobile phone. |  | Component Matrix | Cronbach's α | Cronbach's α (Standardised Items) | N |
| Statistics  |  | 1                | 0.97         | 0.97                              | 7 |
| Scale Items   |  | Mean (R)         |              | Std. Dev.                         |   |
| 1   | Like (1) – Dislike (7)                     | 2.95             |              | 1.76                              |   |
| 2   | Irritating (1) – Not irritating (7)        | 3.00             |              | 1.69                              |   |
| 3   | Favourable (1) – Not favourable (7)        | 2.55             |              | 1.40                              |   |
| 4   | Pleasant (1) – Unpleasant (7)              | 2.85             |              | 1.31                              |   |
| 5   | Likeable (1) – Unlikeable (7)              | 2.70             |              | 1.49                              |   |
| 6   | Positive (1) – Negative (7)                | 2.70             |              | 1.49                              |   |
| 7   | Overall liking (1) – Overall disliking (7) | 2.70             |              | 1.49                              |   |

Table 5.f: Initial Questionnaire

| Initial Questionnaire |   |   |   |
|-----------------------|---|---|---|
|                       | Measure   | Question  | Scale Items   |
| 1                     | Attitude toward receiving mobile advertising, $A_{rmADi}$ | Please rate your view on receiving advertisements on your mobile phone. | Like/Dislike<br>Irritating/Not irritating<br>Favourable/Not favourable<br>Pleasant/Unpleasant<br>Likeable/Unlikeable<br>Positive/Negative<br>Overall liking/Overall disliking |
| 2                     | Initial Attitude toward different brands, $A_{bi}$        | Indicate your opinion of the following 'PRODUCT' brands:                | Dislike the brand for this product / Neither like nor dislike / Like the brand for this product<br>(Slider bar with scale between 1-100)                                      |
| 3                     | Brand Preferred, $B_p$                                    | Which brand do you prefer?  | 'PRODUCT Brand' with dummy brand A (logo)<br>'PRODUCT Brand' with dummy brand B (logo)<br>(Choose between two dummy brands)   |

Table 5.g: Measure of Stage of Buyer Decision Process  $S_{BDP}$ 

| Measure of Stage of Buyer Decision Process $S_{BDP}$  |   |                  |                     |  |   |
|---|---|------------------|---------------------|--|---|
| <i>Please select any of the following that best describe your current position at the moment.</i> |   | Component Matrix | Cronbach's $\alpha$ | Cronbach's $\alpha$ (Standardised Items) | N |
| Statistics  |   | 1                | 0.82                | 0.82                                     | 4 |
| Scale Items   |   | Mean (R)         |                     | Std. Dev.                                |   |
| 1   | I feel the need for ' <i>PRODUCT</i> '. (1 - 7)                               | 4.03             |                     | 1.92                                     |   |
| 2   | I would like to seek more information for ' <i>PRODUCT</i> '. (1 - 7)         | 3.92             |                     | 1.88                                     |   |
| 3   | I am currently considering alternative brands for ' <i>PRODUCT</i> '. (1 - 7) | 4.23             |                     | 1.90                                     |   |
| 4   | I intend to purchase ' <i>PRODUCT</i> '. (1 - 7)                              | 4.28             |                     | 1.98                                     |   |

#### **5.4.2 Intermediate Questionnaire**

The intermediate set of questionnaires was designed to collect data on *Stage of buyer decision process* and *Information Recall* as shown in Table 5.h.

***Stage of buyer decision process*** – Adapted from the well accepted general model of the buyer decision process (Kotler and Armstrong, 2008, pp. 147-149), this scale measured the progression of a participant in the stage of buyer decision right after the viewing of each advertisement. This scale is primarily used as a measure of the effectiveness of the advertisement by way of cognition. The scale was composed of four scale items using a 7-point summated ratings scale. Descriptive statistics can be found in Table 5.g.

#### ***Reliability***

Analysis of pre-test data indicated that the questions were unidimensional and yielded a reliability (alpha) value of 0.82.

***Information Recall*** –The measure for information recall comprised 15 yes/no/not sure options for the question “What did you see on the ad?”. This construct provides the experimenter with a measure of the amount of information participants were able to remember from the advertisement. Although the advertisement for low involvement product had four descriptive points and high involvement product had ten descriptive points to differentiate the degree of product involvement, the questionnaire for both advertisements contained the same number of questions.

#### **5.4.3 Final Questionnaire**

The final set of questionnaires was designed to collect data on *Brand Recall*, *Attitude Toward the Ad*, *Informativeness of the Ad*, *Novelty*, *Attitude Toward Receiving the Type of Mobile Phone Ad*, *Attitude Toward the Brand*, *Comments*, *Age* and *Gender* as shown in Table 5.i.

Table 5.h: Intermediate Questionnaire

| Intermediate Questionnaire |   |   |   |
|----------------------------|---|---|---|
|                            | Measure   | Question  | Scale Item  |
| 1                          | Stage of buyer decision process after viewing each of the advertisements, $S_{BDP}$ | <i>Please select any of the following that best describe your current position at the moment.</i> | I feel the need for 'PRODUCT'?<br>(need recognition)<br><br>Agree/Disagree  |
|                            |   |   | I would like to seek more information for 'PRODUCT'?<br>(information search)<br><br>Agree/Disagree  |
|                            |   |   | I am currently considering alternative brands for 'PRODUCT'?<br>(evaluation of alternatives)<br><br>Agree/Disagree  |
|                            |   |   | I intend to purchase 'PRODUCT'.<br>(purchase intention)<br><br>Agree/Disagree   |
|                            |   |   |   |
| 2                          | Information recall, $I_r$   | What did you see on the ad?<br>(Yes, No, Not Sure)<br><br>0 – incorrect, 1 correct                | <b>CAR</b><br>1 - Dual Airbags<br>0 - Single Airbag<br>1 - Alloy Wheels<br>1 - ABS Breaks<br>1 - Heated Electric Leather Seats<br>1 - Traction Control<br>1 - Fuel Injection<br>0 - Security System<br>1 - 5 Speed Tiptronic Transmission<br>0 - 6 Speed Tiptronic Transmission<br>1 - Rear Wiper<br>1 - Bose 6 Speaker Stereo<br>0 - Altec Lansing 6 Speaker Stereo<br>0 - Air Condition<br>1 - Central Locking<br><br><b>BEER</b><br>0 - 5% ALC/VOL<br>1 - 4% ALC/VOL<br>0 - 3% ALC/VOL<br>1 - Approximately 1.0 Standard Drinks<br>0 - Approximately 1.4 Standard Drinks<br>0 - Approximately 1.2 Standard Drinks<br>0 - Manufactured in Thailand<br>0 - Manufactured in Australia<br>0 - Manufactured in South Africa<br>1 - Manufactured in New Zealand<br>1 - 330ml<br>0 - 355ml<br>0 - 500ml<br>0 - 375ml<br>0 - 440ml |

Table 5.i: Attitude Toward the Ad  $A_{ad}$

| Attitude Toward the Ad A <sub>ad</sub>   |                                      |                  |              |                                   |   |
|--|--------------------------------------|------------------|--------------|-----------------------------------|---|
| <i>Please indicate on the scale on how much you agree or disagree to the following statements about the 'AD TYPE'.</i> |                                      | Component Matrix | Cronbach's α | Cronbach's α (Standardised Items) | N |
| Statistics   |                                      | 1                | 0.95         | 0.95                              | 5 |
| Scale Items  |                                      | Mean (R)         |              | Std. Dev.                         |   |
| 1  | I dislike the ad. (1 – 7)            | 4.63             |              | 1.62                              |   |
| 2  | The ad is appealing to me. (1 – 7)   | 4.40             |              | 1.68                              |   |
| 3  | The ad is attractive to me. (1 – 7)  | 4.23             |              | 1.74                              |   |
| 4  | The ad is interesting to me. (1 – 7) | 4.33             |              | 1.76                              |   |
| 5  | I think the ad is bad. (1 – 7)       | 4.70             |              | 1.63                              |   |

#### 5.4.3.1 Brand Recall

**Brand Recall** – Five brand logos of the product were presented and participants were asked to indicate the brand they saw from the corresponding advertisements. The same question was repeated for all three types of advertisements viewed.

#### 5.4.3.2 Final Attitudes

**Attitude toward the ad**– This scale was adapted from the Lee and Mason (1999) and Lee (2000) scales for overall attitude toward the advertisement. The original scale consisted of five scale items using a 7-point summated ratings scale. Descriptive statistics can be found in Table 5.i.

#### *Reliability*

Alpha reliabilities of 0.91 and 0.93 were reported by Lee and Mason (1999). Analysis of pre-test data indicated that the questions were unidimensional and yielded a reliability alpha value of 0.95.

**Final attitude toward receiving mobile ad, final attitude toward the mobile phone and final attitude toward brand** – These constructs used the same scale items as their initial counterparts. The only difference was that the questions are asked after the viewing of the advertisements. Please refer to section 5.4.1.2 for more detail.



#### 5.4.3.3 Informativeness

***Informativeness of the ad*** – the informativeness of the advertisement was used to measure the effectiveness of the advertisement in conveying information. An adapted scale of *product information relevancy* by Mason et al. (2001) with a reliability of alpha 0.74 was used. Three out of four scale items “*the information provided were relevant to the ratings task*”, “*the information provided was helpful in answering other questions*” and “*the information that was provided aided me in completing the ratings task*” were removed from the scale as they were intended to measure product information relevance rather than measure the effectiveness of the advertisement. Scale items “*the ad was informative*”, “*the information in the ad was easy to understand*” and “*the information in the ad was relevant*” were added in addition to the scale item “*the information that was provided in the ad would help me in making a choice of PRODUCT*” by Mason et al. (2001). Once again 7-point summated ratings scale was used. Descriptive statistics can be found in Table 5.j.

#### *Reliability*

Analysis of pre-test data indicated that the questions were unidimensional and yielded a reliability (alpha) value of 0.83.

#### 5.4.3.4 Novelty

***Novelty*** – This construct allowed participants to indicate whether the advertisement was perceived as novel through familiarity with the type of advertisement. Table 5.k shows the dichotomous questions asked in the experiment. Novelty was included to establish if it had an effect on various attitude dependent variables in this study. For the purpose of this experiment, the word “*Interactive*” was used instead of “*AR*” to describe AR advertisements as this term would be more informative for participants than technical term.

Table 5.j: Informativeness of the Ad I<sub>ad</sub>

| Informativeness of the Ad I <sub>ad</sub>  |                  |              |                                   |   |
|--|------------------|--------------|-----------------------------------|---|
| <i>Please indicate on the scale on how much you agree or disagree to the following statements about the 'AD TYPE'.</i> | Component Matrix | Cronbach's α | Cronbach's α (Standardised Items) | N |
| Statistics   | 1                | 0.83         | 0.84                              | 4 |
| Scale Items  | Mean (R)         |              | Std. Dev.                         |   |

|   |  |      |      |
|---|--|------|------|
| 1 | The ad was informative. (1- 7)   | 4.83 | 1.58 |
| 2 | The information in the ad was easy to understand. (1 – 7)  | 4.88 | 1.69 |
| 3 | The information in the ad was relevant. (1 – 7)  | 5.45 | 1.24 |
| 4 | The information that was provided in the ad would help me in making a choice of 'PRODUCT'. (1 – 7) | 4.25 | 1.81 |

Table 5.k: Novelty of the Ad

| Vividness | Question  |
|-----------|---|
| High      | Were you familiar with mobile phone <i>Interactive Ads</i> prior to today? (Yes/No) |
| Medium    | Were you familiar with mobile phone <i>Video Ads</i> prior to today? (Yes/No)       |
| Low       | Were you familiar with mobile phone <i>Image Ads</i> prior to today? (Yes/No)       |

#### 5.4.3.5 Comments

**Comments** – An open-ended comment section allowed participants to provide any additional comments. This open-ended comment section provided greater insight into the participants' perception about the advertisements and the experiment as a whole.

#### 5.4.3.6 Basic Demographic Information

**Age** – A text box to allow participants to key in their age obtained demographic information on the age distribution of the sample group.

**Gender** – An option box to indicate gender obtained demographic information on the gender distribution of the sample group.

Table 5.1: Final Questionnaire

| Final Questionnaire |  |   |   |
|---------------------|--|---|---|
|                     | Measure  | Question  | Scale Item  |
|                     | <i>You will be asked a series of questions regarding the 3 different types of ads (Image Ad, Video Ad and Interactive Ad) that you have just viewed.</i> |   |   |
| 1                   | Association of ad to brand or Brand Recall, $B_r$  | <i>What brand was on the 'Ad Type'?</i>   | <i>What brand was on the 'Ad Type'?</i><br>(Choose from 5 brand logos)                            |
| 2                   | Attitude towards the three different Ads, $A_{ad}$   | <i>Please indicate on the scale on how much you agree or disagree to the following statements about the 'Ad Type'.</i>        | <i>I dislike the ad.</i>  |
|                     |  |   | <i>The ad is appealing to me.</i>   |
|                     |  |   | <i>The ad is attractive to me.</i>  |
|                     |  |   | <i>The ad is interesting to me.</i>   |
|                     |  |   | <i>I think the ad is bad.</i>   |
| 3                   | Effectiveness of different type of ad in conveying information, $I_{ad}$   | <i>Please indicate on the scale on how much you agree or disagree to the following statements about the 'Ad Type'.</i>        | <i>The ad was informative.</i>  |
|                     |  |   | <i>The information in the ad was easy to understand.</i>  |
|                     |  |   | <i>The information in the ad was relevant.</i>  |
|                     |  |   | <i>The information that was provided in the ad would help me in making a choice of 'PRODUCT'.</i> |
| 4                   | Existence of novelty effect, $N_{eff}$   | <i>Were you familiar with mobile phone 'Ad Type' prior to today?</i>  | <i>Yes/No</i>   |
| 5                   | Attitude toward receiving mobile advertising, $A_{rmAdf}$  | <i>Assuming you have a mobile phone, please rate your interest in receiving 'Ad Type' on your mobile phone in the future?</i> | <i>Like/Dislike</i>   |
|                     |  |   | <i>Irritating/Not irritating</i>  |
|                     |  |   | <i>Favourable/Not favourable</i>  |
|                     |  |   | <i>Pleasant/Unpleasant</i>  |
|                     |  |   | <i>Likeable/Unlikeable</i>  |
|                     |  |   | <i>Positive/Negative</i>  |
| 6                   | Attitude toward different brands, $A_{bf}$   | <i>Indicate your opinion of the following brands:</i>   | <i>Dislike the brand for this product / Like the brand for this product</i>                       |
|                     |  |   | <i>(Slider bar with scale between 1-100)</i>  |
| 7                   | Others   | <i>Comments</i><br>(Please put in any comments that you would like to add)  | <i>Text Box</i>   |
| 8                   | Age  | <i>Please enter your age.</i>   | <i>Text box</i>   |
| 9                   | Gender, G  | <i>Please specify your gender.</i>  | <i>Male/Female</i>  |

## 5.5 EXPERIMENTAL PROCEDURES

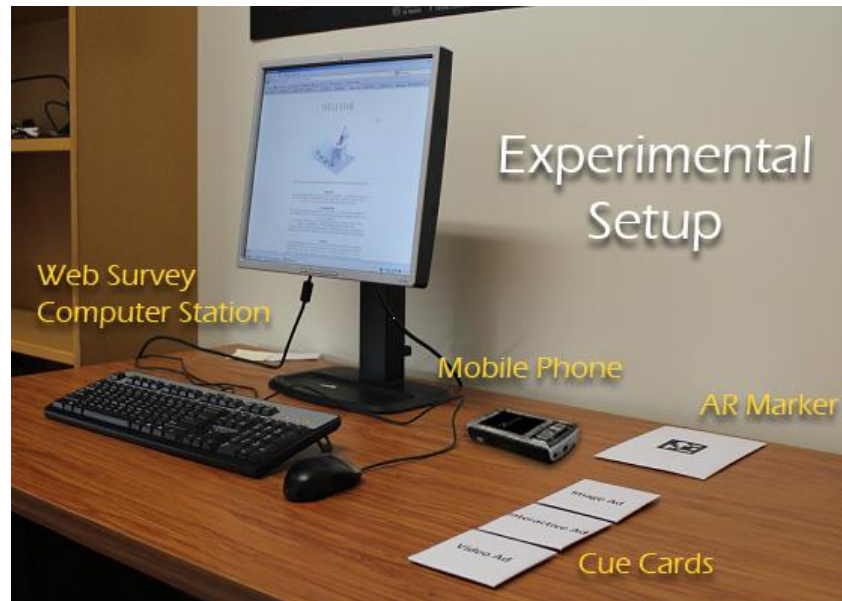


Figure 5.f: Experimental Setup

The main experiment setup consisted of a computer, a Nokia N95 mobile phone, an AR marker, three cue cards, the web questionnaires, and mobile phone software advertisements. Figure 5.f shows the layout of the actual experimental setup used for the duration of the experiment.

### *Structure*

The experimental study consists of three main components – five questionnaire sections and the viewing of three different mobile phone advertisements. Participants were asked to immerse themselves in a scenario prior to viewing the three mobile phone advertisements. Figure 5.g shows the experiment process structure. Each step of the process is discussed in detail in the rest of this chapter.

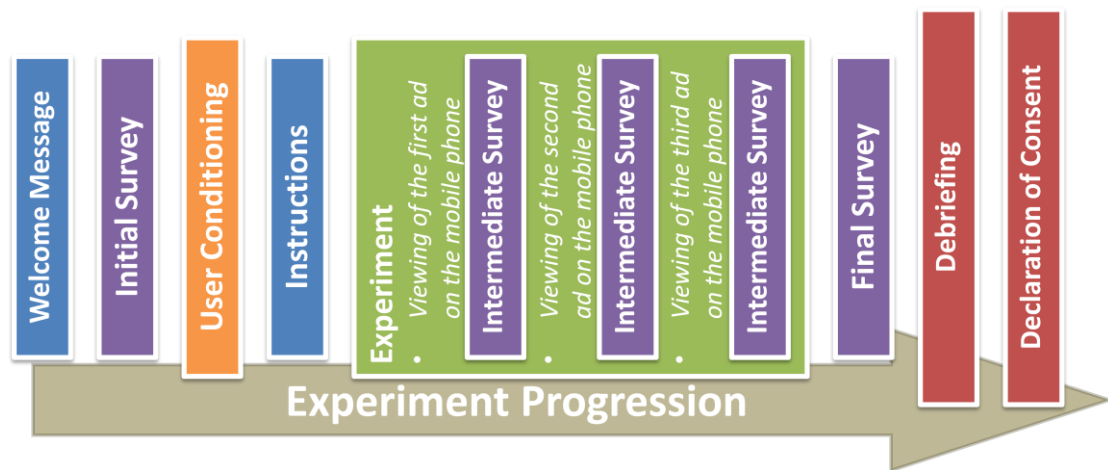


Figure 5.g: Experiment Process Structure

### 5.5.1 *Welcome Message*

Participants seated in front of the computer were greeted by a welcome message containing information outlining the structure of the experiment, a statement relating to confidentiality, the purpose of the experiment, and an assurance that the project had been reviewed and approved by the University of Canterbury Human Ethics Committee (Appendix Three, Figure A.5.1a). Participants were also assigned a unique random number generated by the server. The random number corresponded to a unique viewing sequence of three different advertisements that were pre-specified in the experiment (Appendix Three, Table A.5b).

### 5.5.2 *Initial Questionnaire*

The welcoming message was then followed by the first series of questionnaires used to measure the initial attitudes and to obtain information to be used later in the experiment. Section 5.4.1 outlines the detailed questions used in the initial questionnaire section. (Appendix Three, Figure A.5.1b)

### 5.5.3 *Conditioning*

After completing the initial questionnaire, participants were conditioned to the stage of buyer decision behaviour corresponding to the random number to which they were assigned. There were three conditioning scenarios in the experiment plus one additional control experiment that did not have a conditioning scenario. Pre-purchase Stages of

buyer decision process were manipulated through compounded scenarios where scenarios in later stages were built on those from previous stages through addition of scenario statements as shown in Table 5.m. This conditioning of participants was achieved by instructing participants to immerse themselves in a role playing scenario displayed on the computer. Participants automatically received a different role playing scenario based on their assigned random number. The scenarios used were *Need Recognition*, *Information Search*, *Evaluation of Alternatives* and *Control*. Table 5.m shows the details for each of the conditioning/role playing scenarios. (Appendix Three, Figure A.5.1c)

Table 5.m: Conditioning Scenarios Details

| Buyer Decision Stages             | Conditioning Scenario  |
|-----------------------------------|--|
| <b>Control</b>                    | No conditioning required.<br><b>C. (process skipped)</b>   |
| <b>Need Recognition</b>           | Participant recognises the need for this product.<br><b>C. (CAR) – Your car has just broken down and you recognise the need for a new car.</b><br><b>C. (BEER) – You have just noticed that you have run out of beer for the BBQ that you will be having.</b>  |
| <b>Information Search</b>         | Participant recognises the need for this product, believes to have all the information about this product and has already identified a favourable BRAND (from a dummy brand).<br><b>C. (CAR) – Your car has just broken down and you recognise the need for a new car. You already know the requirements that you would like to have on a car. You prefer the car maker brand (Dummy Brand).</b><br><b>C. (BEER) – You have just noticed that you have run out of beer for the BBQ that you will be having. You already know which type of beer you like. You are used to the brand (Dummy Brand).</b>   |
| <b>Evaluation of Alternatives</b> | Participant recognises the need for this product, believes to have all the information about this product, has already identified a favourable BRAND (from a dummy brand), has already evaluated alternative brands and ready to purchase a new car (from a dummy brand).<br><b>C. (CAR) – Your car has just broken down and you recognise the need for a new car. You already know the requirements that you would like to have on a car. You prefer the car maker brand (Dummy Brand) after considering alternative brands. You intend to purchase a new car by the brand (Dummy Brand).</b><br><b>C. (BEER) – You have just noticed that you have run out of beer for the BBQ that you will be having. You already know which type of beer you like. You are used to the brand (Dummy Brand) after considering alternative brands. You intend to purchase a case of \$brand beer. (Dummy Brand)."</b> |

#### 5.5.4 Instructions

Participants were later informed that 1) they will be assigned a mobile phone containing a series of three different advertisements, 2) they will be asked to complete two questions after viewing each advertisement and 3) they are to click the next button on the web interface when they have been assigned a mobile phone and ready to proceed with the experiment. (Appendix Three, Figure A.5.1c)

#### 5.5.5 Experiment

The experiment consisted of a sequence of three different forms of advertisements shown on the mobile phone. The ads *Image*, *Video* and *AR* were shown in a different order based on the random number previously assigned to the participant. After viewing each advertisement, a cue card (Figure 5.h) corresponding to the type of advertisement was placed on the table to remind the participant of the type of advertisement that had just been viewed. The cards were laid out in the same order in which the advertisements had been viewed, and remained on the table for the duration of the experiment. This enabled participants to better associate the type of advertisement with the advertisement they viewed and which they subsequently used for the final questionnaire section. The duration of time participants spent viewing the advertisement was automatically recorded on the computer. In addition, the participants' behaviour when viewing the advertisements was observed.



Figure 5.h: Ad type reminder cue cards

### **5.5.6 Intermediate Questionnaire**

Immediately after viewing each of the three advertisements, participants were asked to fill out the intermediate questionnaires that contained two questions. This allowed the experimenter to determine the participants' stage of buyer decision behaviour after viewing each of the advertisements and to determine the amount of information participants could recall from each advertisement. Section 5.4.2 outlines the detailed questions used in the intermediate questionnaire section. (Appendix Three, Figure A.5.1e, A.5.1h, A.5.1k)

### **5.5.7 Final Questionnaire**

The final questionnaire consisted of four sections, *ad related*, *brand related*, *demographic information*, and *general* questions. (Appendix Three, Figure A.5.1l)

***Ad related questions*** were asked in the final questionnaire after viewing all three different advertisements to avoid participants knowing what questions would be asked before completing the experiment. This section collected data on brand recall or association of the brand to the advertisement, attitude toward the advertisement, informativeness of the advertisement, attitude toward receiving the type of advertisement, and novelty of the advertisement.

***Brand related questions*** identified the participants' attitude toward the different brands after the viewing of the advertisements, hence providing information on the effect of the different advertisements on attitude towards the brand.

***Demographic information questions*** provided age, gender, whether or not participants were current consumers of the product, and their experience with advertising and marketing information.

***General questions*** provided information on the participants' attitude towards the mobile phone used in the experiment after viewing the advertisements and allowed participants to comment on the experiment as a whole.



Section 5.4.3 outlines the detailed questions used in the initial questionnaire section.

#### ***5.5.8 Debriefing***

After completing the experiment, participants were informed of the purpose of the experiment and that all products featured in the experiment do not depict the actual product supported by the associated brands.

#### ***5.5.9 Principal Consent***

As required by the University of Canterbury, consent was obtained from participants through a web based consent form. The consent form informed participants of their right to withdraw from the experiment at any time prior to publication of the findings. Participants were also made aware that information collected will be stored securely at the University of Canterbury for five years following the study and participants will remain anonymous and confidential to the researcher. (Appendix Three, Figure A.5.1m)

## Chapter Six: RESULTS AND ANALYSIS

### 6.1 INTRODUCTION

This chapter presents the results of the statistical analysis. Information on sample size and composition is presented first, followed by checks on scale structure, reliability, outliers and manipulation. The hypotheses are then tested. The chapter concludes with a summary of comments obtained and the results of the observation analysis.

### 6.2 SAMPLE SIZE AND COMPOSITION

As outlined in section 5.1.1, 288 participants were required for the experiment. Recruitment emails were sent out to university students with the assistance of departmental administrators from the law, psychology, science, history and management departments. Participants were also recruited through posters displayed throughout the university.

Data collection ran from 3<sup>rd</sup> June 2010 to 13<sup>th</sup> August 2010. A total of 144 hours were spent on conducting the experiment. Out of 319 participants who registered for the experiment before registration was closed, 31 (20 female, 11 male) registrants did not turn up for the experiment. The sample size of 288 participants was between the ages of 17 to 59 and had a mean age of 23.5 years. Figure 6.a shows the age distribution of the sample group. As expected from a student sample, the age distribution was heavily skewed towards the younger age group. As the likely target group for this type of technology are younger consumers, this distribution is not considered to be a problem.

For gender distribution, the sample consisted of 137 (47.57%) male and 151 (52.43%) female. This is a fair representation of the NZ population with 49.06% male and 50.94% female (Statistics New Zealand, 2010). Figure 6.b depicts the gender distribution across all designated experimental groups. The gender distribution in each *Stage of Buyer Decision Process* group varied, with the male to female ratio ranging between 31:41 and 36:36 (control, 31:41; nr, 35:37; is, 36:36; ea, 35:37). The gender distribution between levels of product involvement was high(A), 70:74 and low(D), 67:77. Additional details on gender distribution can be found in Figure 6.b.

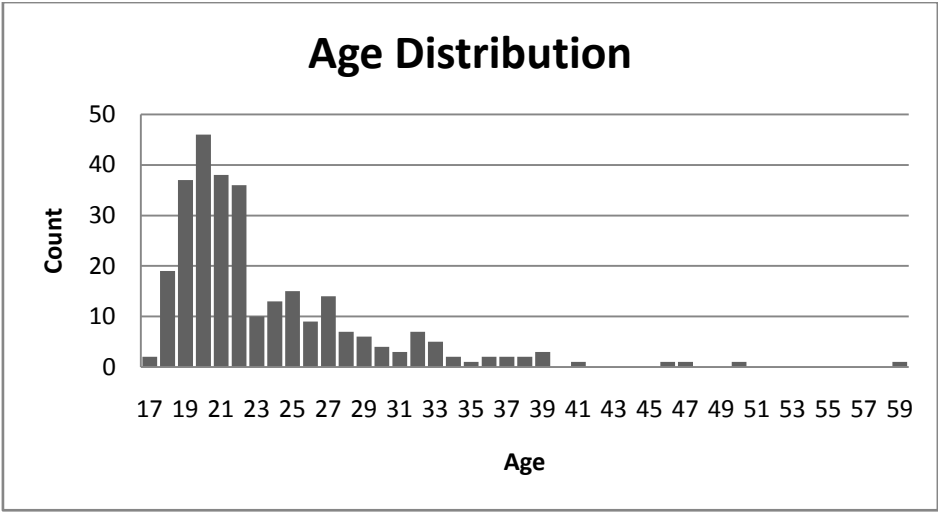
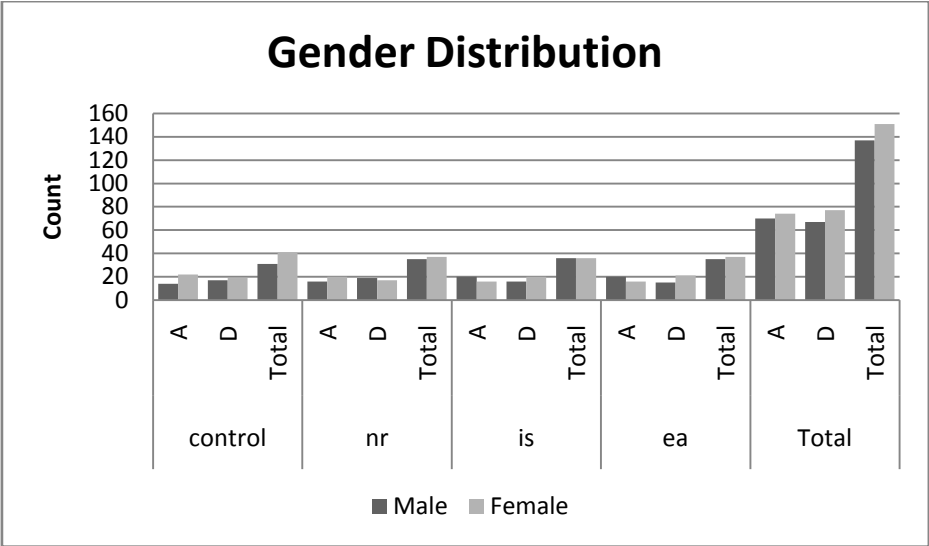


Figure 6.a: Plot of Age Distribution for Sample.



A = high product involvement  
 D = low product involvement  
 6.2.1

nr = need recondition  
 is = information search  
 ea = evaluation of alternatives  
 6.2.2

Figure 6.b: Plot of Gender Distribution for Samplefor Different Levels of Product Involvement and Stage of Buyer Decision Process.

### 6.3 SCALE STRUCTURE, RELIABILITY AND OUTLIERS

All scales used in the study were first recoded into low to high values to reflect negative to positive responses, to facilitate the interpretation of results. Scales were tested for dimensionality using principal component analysis, non-normality using skewness and kurtosis, and reliability using Cronbach's alpha. Outliers were replaced with the highest value within  $z = +3.00$  in order to reduce potential biases in the results. A detailed report of all variables is shown in Table 6.a.

#### 6.3.1 Dependent Variables

The dependent variables were *Informativeness of the Ad* ( $I_{ad}$ ), *Change of Attitude Toward Receiving Mobile Phone Ad* ( $\Delta A_{rmAd}$ ), *Attitude Toward the Ad* ( $A_{ad}$ ), *Time Spent Viewing Ad* ( $T_{ad}$ ), *Information Recall* ( $I_r$ ), *Brand Recall* ( $B_r$ ), *Change of Attitude Toward the Actual Brand* that was shown in the ad ( $\Delta A_b$  (Actual)) and *Change of Attitude Toward the Perceived Brand* that participants believe they saw in the ad ( $\Delta A_b$  (Perceived)). As reported in Chapter Five,  $I_{ad}$ ,  $A_{rmAd}$  and  $A_{ad}$  were multi-scaled variables whereas  $A_b$  was a mono-scaled variable and  $T_{ad}$  was a time measurement. In the measurement of recall,  $I_r$  is the percentage of advertisement content correctly recalled immediately after viewing the first advertisement and  $B_r$  provides a binary measurement of '0' for incorrect and '1' for correct recall of the brand in the advertisement.  $\Delta A_{rmAD}$  and  $\Delta A_b$  were calculated as the difference between initial and final attitudes.

The use of mixed design in the experiment meant that each of variables was measured three times under different degrees of vividness scenarios; *low* (Image, IMG), *mid* (Video, VID) and *high* (Augmented Reality, AR). Analyses of the variables for all three vividness scenarios were conducted separately. Details can be found in Table 6.b.

##### 6.3.1.1 Dimensionality

Dependent multi-scaled variables  $I_{ad}$ ,  $\Delta A_{rmAD}$  and  $A_{ad}$  were tested for dimensionality using principal components factor analysis. All three variables were found to be uni-dimensional in all three vividness scenarios.

### 6.3.1.2 Reliability

Reliability of the scales for variables  $I_{ad}$ ,  $\Delta A_{rmAD}$  and  $A_{ad}$  were tested using Cronbach's alpha. All scales for the variables were determined to be within an acceptable value of  $\alpha > .70$ :  $I_{ad}$  ( $\alpha = .78$ , IMG;  $\alpha = .82$ , VID;  $\alpha = .85$ , AR),  $\Delta A_{rmAD}$  ( $\alpha = .92$ , IMG;  $\alpha = .90$ , VID;  $\alpha = .93$ , AR) and  $A_{ad}$  ( $\alpha = .88$ , IMG;  $\alpha = .88$ , VID;  $\alpha = .89$ , AR).

### 6.3.1.3 Normality and Outliers

A comparison of the distribution of dependent variables  $I_{ad}$ ,  $\Delta A_{rmAD}$ ,  $A_{ad}$ ,  $T_{ad}$ ,  $I_r$ ,  $\Delta A_b$  (Actual) and  $\Delta A_b$  (Perceived) with a normal curve fit can be found in Figures 6.c -6.h.

The skewness and kurtosis levels of the dependent variables were:  $I_{ad}$  (IMG:  $-.89$ ,  $1.41$ ; VID:  $-.49$ ,  $.09$ ; AR:  $-.64$ ,  $.14$ ),  $\Delta A_{rmAD}$  (IMG:  $.16$ ,  $.29$ ; VID:  $.30$ ,  $.29$ ; AR:  $.06$ ,  $.29$ ),  $A_{ad}$  (IMG:  $-.08$ ,  $-.24$ ; VID:  $-.04$ ,  $-.30$ ; AR:  $-.99$ ,  $.55$ ) and  $I_r$  (IMG:  $.44$ ,  $-.76$ ; VID:  $.47$ ,  $-.71$ ; AR:  $.77$ ,  $-.16$ ) fell within acceptable range of  $(-1, 1)$  for skewness (Hair et al, 1998) and  $(-2, 2)$  for kurtosis levels (Morgan et. al., 1988). Therefore, it is considered satisfactory to assume normal distribution for all four of the above dependent variables.

Outliers from the continuous variable  $T_{ad}$  that were in excess of  $z = +3.00$  (Tabachnick & Fidell, 2007, p. 73) were replaced with the highest value within  $z = +3.00$ . There were no outliers found with  $z < -3.00$ . Table 6.a shows a list values that were replaced for the variable  $T_{ad}$ . The new modified variable  $T_{ad}$  (IMG:  $.11$ ,  $.8$ ; VID:  $1.0$ ,  $1.3$ ; AR:  $1.0$ ,  $1.0$ ) was able to satisfy the assumption of normal distribution.

$\Delta A_b$  (Actual) (IMG:  $.15$ ,  $6.91$ ; VID:  $1.39$ ,  $9.20$ ; AR:  $1.80$ ,  $7.41$ ) and  $\Delta A_b$  (Perceived) (IMG:  $1.46$ ,  $6.42$ ; VID:  $1.81$ ,  $10.44$ ; AR:  $1.851$ ,  $7.56$ ) did not meet the assumption for normal distribution. Hence both variables were not used on analysis that requires assumption of normal distribution.

Table 6.a: Outliers for  $T_{ad}$  that were replaced with the highest value within  $z = +3.00$

|          | z score | Time spent viewing ad | Replaced time |
|----------|---------|-----------------------|---------------|
| Image Ad | 4.59    | 59 sec                | 45 sec        |
|          | 3.52    | 50 sec                | 45 sec        |
|          | 3.41    | 49 sec                | 45 sec        |
| Video Ad | 5.36    | 68 sec                | 50 sec        |
|          | 4.37    | 61 sec                | 50 sec        |
|          | 3.94    | 58 sec                | 50 sec        |
|          | 3.80    | 57 sec                | 50 sec        |
|          | 3.24    | 53 sec                | 50 sec        |
|          | 3.10    | 52 sec                | 50 sec        |
| AR Ad    | 5.33    | 141 sec               | 95 sec        |
|          | 4.33    | 122 sec               | 95 sec        |
|          | 4.06    | 117 sec               | 95 sec        |

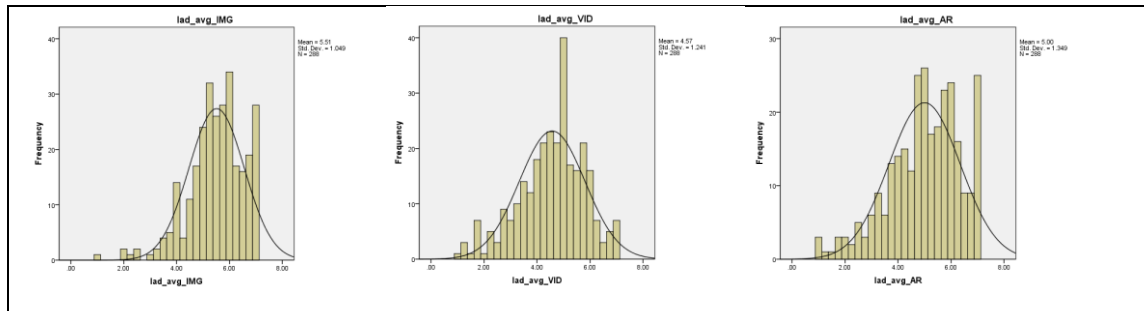


Figure 6.c: Distribution of Informativeness of the Advertisement for Different Vividness.

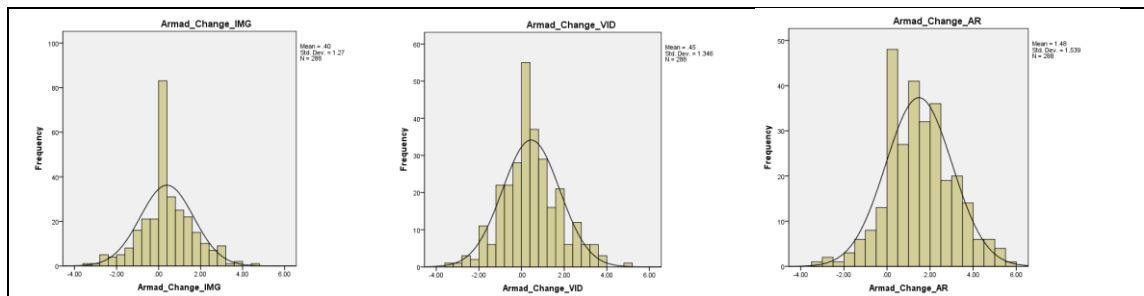


Figure 6.d: Distribution of Change of Attitude Toward Receiving Mobile Phone Advertisement for Different Levels of Vividness.

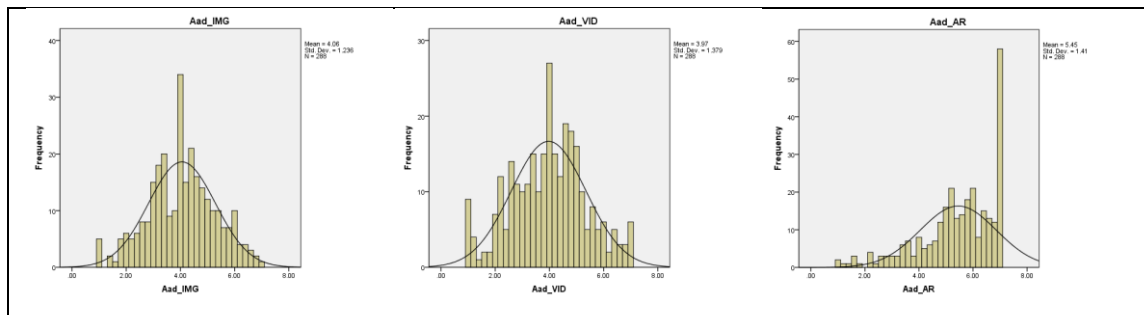


Figure 6.e: Distribution of Attitude Toward the Advertisement for Different Levels of Vividness.

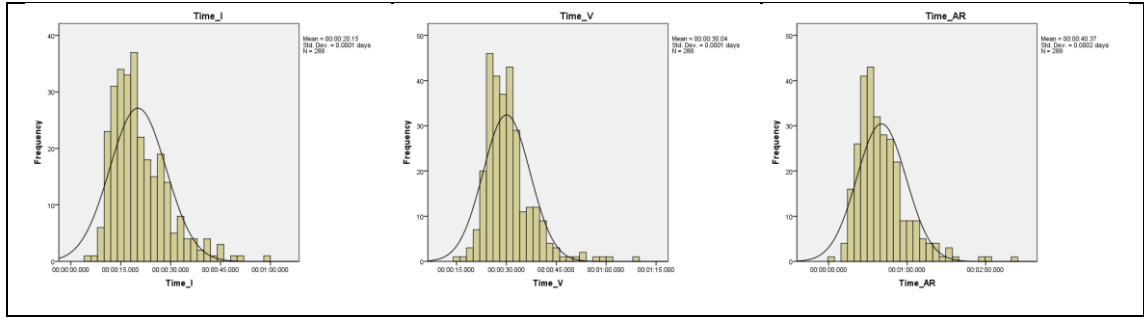


Figure 6.f: Distribution of Time Spent Viewing Advertisement Before Outliers were Removed.

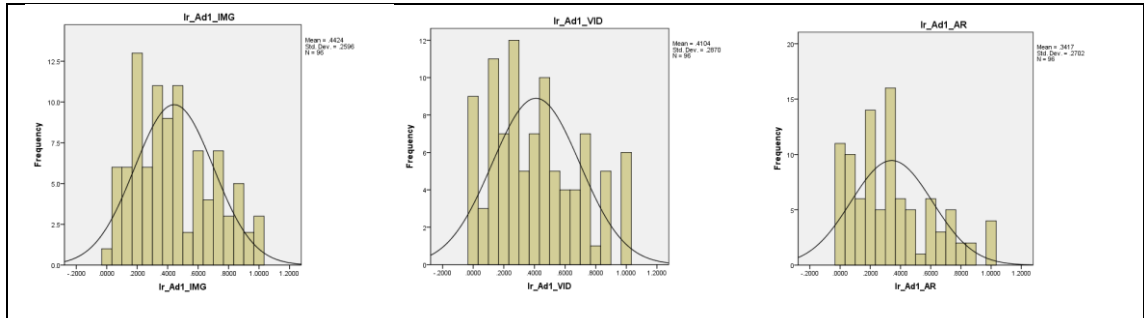


Figure 6.g: Distribution of Information Recall for Different Levels of Advertisement Vividness for the First Advertisement that was Viewed.

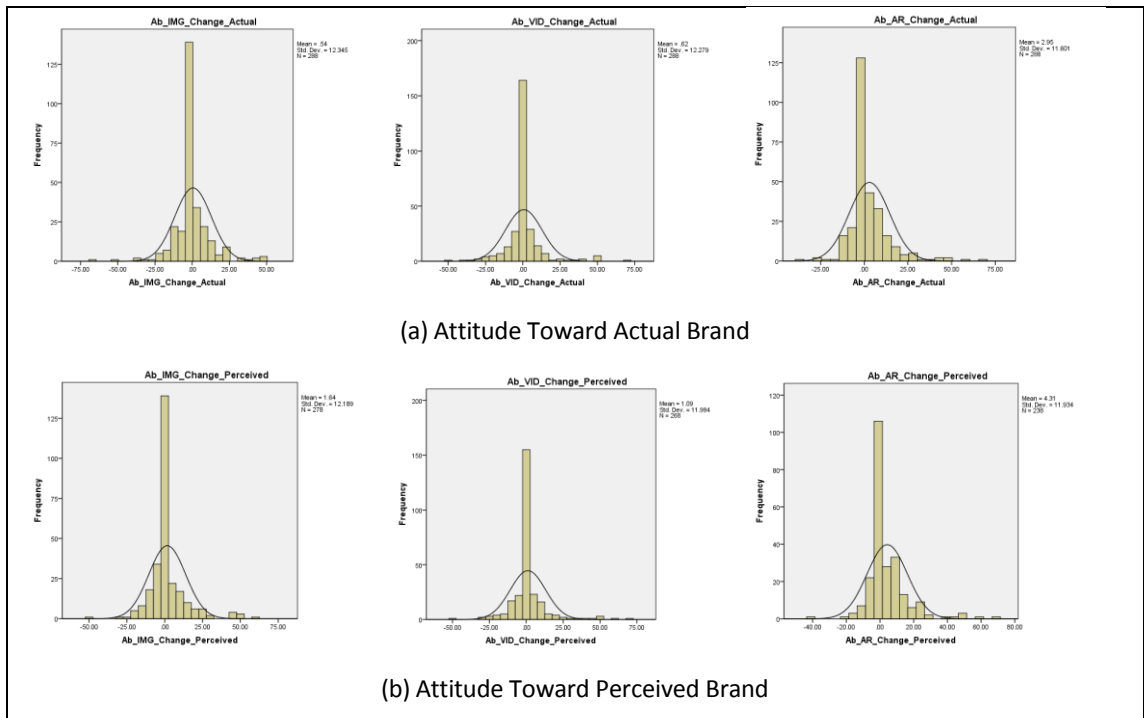


Figure 6.h: Distribution of Attitude Toward the Brand for Different Levels of Vividness.

Table 6.b: Factor Analysis, Reliability Test and Descriptive Statistics for All Variables.

|                             |             | N         | Factor Analysis  | Reliability         |  |             | Mean      | Std. Deviation | Variance  | Skewness  | Kurtosis  |
|-----------------------------|-------------|-----------|------------------|---------------------|--|-------------|-----------|----------------|-----------|-----------|-----------|
|                             |             | Statistic | Component Matrix | Cronbach's $\alpha$ | Cronbach's $\alpha$ (Standardised Items) | Scale Items | Statistic | Statistic      | Statistic | Statistic | Statistic |
| Dependent Variables         |             |           |                  |                     |  |             |           |                |           |           |           |
| $I_{ad}$                    | Image       | 288       | 1                | 0.76                | 0.78                                     | 4.00        | 5.51      | 1.05           | 1.10      | -0.89     | 1.41      |
|                             | Video       | 288       | 1                | 0.81                | 0.82                                     | 4.00        | 4.57      | 1.24           | 1.54      | -0.49     | 0.09      |
|                             | Interactive | 288       | 1                | 0.85                | 0.86                                     | 4.00        | 5.00      | 1.35           | 1.82      | -0.64     | 0.14      |
| $\Delta A_{rmAD}$           | Image       | 288       | 1                | 0.92                | 0.93                                     | 7.00        | 0.40      | 1.27           | 1.61      | 0.16      | 0.29      |
|                             | Video       | 288       | 1                | 0.90                | 0.92                                     | 7.00        | 0.45      | 1.35           | 1.81      | 0.30      | 0.29      |
|                             | Interactive | 288       | 1                | 0.93                | 0.92                                     | 7.00        | 1.48      | 1.54           | 2.37      | 0.06      | 0.29      |
| $A_{ad}$                    | Image       | 288       | 1                | 0.88                | 0.88                                     | 5.00        | 4.06      | 1.24           | 1.53      | -0.08     | -0.24     |
|                             | Video       | 288       | 1                | 0.88                | 0.88                                     | 5.00        | 3.97      | 1.38           | 1.90      | -0.04     | -0.30     |
|                             | Interactive | 288       | 1                | 0.89                | 0.89                                     | 5.00        | 5.45      | 1.41           | 1.99      | -0.99     | 0.55      |
| $T_{ad}$                    | Image       | 288       | -                | -                   | -  | -           | 20.07     | 8.18           | 66.91     | 1.02      | 0.80      |
|                             | Video       | 288       | -                | -                   | -  | -           | 29.87     | 6.43           | 41.40     | 1.00      | 1.25      |
|                             | Interactive | 288       | -                | -                   | -  | -           | 40.03     | 17.55          | 307.96    | 1.04      | 1.02      |
| $I_r$                       | Image       | 96        | -                | -                   | -  | -           | 0.44      | 0.26           | 0.07      | 0.44      | -0.76     |
|                             | Video       | 96        | -                | -                   | -  | -           | 0.41      | 0.29           | 0.08      | 0.47      | -0.71     |
|                             | Interactive | 96        | -                | -                   | -  | -           | 0.34      | 0.27           | 0.07      | 0.77      | -0.16     |
| $\Delta A_b$<br>(Actual)    | Image       | 288       | -                | -                   | -  | -           | 0.54      | 12.35          | 152.41    | 0.15      | 6.91      |
|                             | Video       | 288       | -                | -                   | -  | -           | 0.62      | 12.28          | 150.77    | 1.39      | 9.20      |
|                             | Interactive | 288       | -                | -                   | -  | -           | 2.95      | 11.60          | 134.58    | 1.80      | 7.41      |
| $\Delta A_b$<br>(Perceived) | Image       | 288       | -                | -                   | -  | -           | 1.64      | 12.19          | 148.58    | 1.46      | 6.42      |
|                             | Video       | 288       | -                | -                   | -  | -           | 1.09      | 11.99          | 143.85    | 1.81      | 10.44     |
|                             | Interactive | 288       | -                | -                   | -  | -           | 4.31      | 11.93          | 142.43    | 1.85      | 7.56      |
| $B_r$                       | Image       | 288       | -                | -                   | -  | -           | 0.65      | -              | -         | -         | -         |
|                             | Video       | 288       | -                | -                   | -  | -           | 0.58      | -              | -         | -         | -         |
|                             | Interactive | 288       | -                | -                   | -  | -           | 0.54      | -              | -         | -         | -         |
| Covariates                  |             |           |                  |                     |  |             |           |                |           |           |           |
| $N_{eff}$                   | Image       | 288       | -                | -                   | -  | -           | 0.21      | -              | -         | -         | -         |
|                             | Video       | 288       | -                | -                   | -  | -           | 0.17      | -              | -         | -         | -         |
|                             | Interactive | 288       | -                | -                   | -  | -           | 0.10      | -              | -         | -         | -         |

\* $I_r$  and  $B_r$  have a value of 1 when correctly chosen and 0 when incorrectly chosen.  $N_{eff}$  shows 1 if novel and 0 if not novel



## 6.4 MANIPULATION CHECKS

### 6.4.1 Stages of Buyer Decision Process

As described in section 5.5.3, users' *SBDP* were manipulated through compounded scenarios where scenarios in later stages were built on those from previous stages through the addition of scenario statements. A control group was used to check the effectiveness of manipulation. Users in the control group were asked to rate their position under the three different stages of buyer decision process comprised of *Need Recognition (nr)*, *Information Search(is)* and *Evaluation of Alternatives (ea)*. Out of the 72 users in the control group, 29.2% indicated positive appeal for *nr*, 29.2% for *is* and 27.8% for *ea*. The manipulated groups showed an increased recognition of being in all three manipulated stages. An increase of 36.1% was shown for *nr* while *is* and *ea* showed increases of 36.1% and 27.8% respectively (Table 6.c).

Table 6.c: Stage of Buyer Decision Process Manipulation Checks.

| Stages                     | Control Groups | Manipulated Groups | Effect Size |
|----------------------------|----------------|--------------------|-------------|
| Need Recognition           | 29.2%          | 65.3%              | 36.1%       |
| Information Search         | 29.2%          | 65.3%              | 36.1%       |
| Evaluation of Alternatives | 27.8%          | 55.6%              | 27.8%       |

Although manipulations of *SBDP* were not completely successful, the conditioning scenarios were able to increase the effect group by at least one fold. Users that were correctly manipulated to their designated *SBDP* showed less than 10% difference between each condition group where Need Recognition, Information Search and Evaluation of Alternatives achieved 65.3%, 65.3% and 55.6% respectively.

### 6.4.2 Product Involvement

Under the differentiation of high and low product involvement categorisation conditions given by Kotler and Armstrong (2008), the consumer requires more time to evaluate high involvement products than low involvement products. A manipulation check was carried out by comparing the amount of time participants spent viewing the car advertisement and the beer advertisement. Analysis of the data showed that participants in the experiment spent an average of 34.74 seconds viewing the car advertisement and an average of 25.53 seconds viewing the beer advertisement. The manipulation check was able to show that car is a higher involvement product than beer.

## 6.5 HYPOTHESIS TESTING AND INTERACTION EFFECTS

In this section, results for proposed hypotheses from the research framework in Chapter Four are presented. Table 6.d shows a list of all hypotheses that were tested and the different tests that were used.

Table 6.d: Test Used for Different Hypotheses

|  | Hypothesis   | Test                       |
|--|--|----------------------------|
| <b>Informativeness</b>                           |  |                            |
| H1.  | Vividness has an effect on Informativeness in different Stages of Buyer Decision Process and different levels of Product Involvement.        | Mixed Design ANCOVA        |
| <b>Time Spent Viewing Ad</b>                     |  |                            |
| H2.  | Vividness has an effect on Time Spent Viewing Ad in different Stages of Buyer Decision Process and different levels of Product Involvement.  | Mixed Design ANCOVA        |
| H2a.   | Vividness has an effect on Information Recall in different Stages of Buyer Decision Process and different levels of Product Involvement.     | Factorial ANCOVA           |
| H2.1.  | There is a relationship between Time Spent Viewing the Ad with the level of Information Recall.  | Simple Linear Regression   |
| H2b.   | Vividness has an effect on Brand Recall in different levels of Product Involvement.  | Nonparametric Test         |
| H2.2   | There is a relationship between Time Spent Viewing the Ad with the level of Brand Recall.  | Simple Logistic Regression |
| <b>Attitude Toward the Ad</b>                    |  |                            |
| H3.  | Vividness has an effect on Attitude Toward the Ad in different Stages of Buyer Decision Process and different levels of Product Involvement. | Mixed Design ANCOVA        |
| H3.1.  | There is a relationship between Attitude Toward the Ad and Brand Recall.   | Simple Logistic Regression |
| H3.2a.   | There is a relationship between Attitude Toward the Ad and Attitude toward the Actual Brand.   | Simple Linear Regression   |
| H3.2b.   | There is a relationship between Attitude Toward the Ad and Attitude toward the Perceived Brand.  | Simple Linear Regression   |
| <b>Attitude Toward Receiving Mobile Phone Ad</b> |  |                            |
| H4   | There is a relationship between Attitude Toward the Ad and Attitude Toward Receiving Mobile Phone Ad.  | Simple Linear Regression   |
| <b>Novelty</b>                                   |  |                            |
| H5.1.  | Novelty has an effect on Time Spent Viewing Ad.  | t-test                     |
| H5.2.  | Novelty has an effect on Attitude Toward the Ad.   | t-test                     |

### 6.5.1 Effects on Informativeness

The first hypothesis examined how a user's perceived *Informativeness* was affected by advertisement *Vividness*, *SBDP* and *Product Involvement*. Hypothesis H1 states that:

*H1. Vividness has an effect on Informativeness in different Stages of Buyer Decision Process and different levels of Product Involvement.*

Mixed design ANCOVA was used to test this hypothesis (Table 6.e). Mauchly's Sphericity test showed that Sphericity was not assumed for  $I_{ad}$  ( $p < 0.01$ ), therefore Greenhouse-Geisser correction was used. Results from the analysis showed that out of the three main effects proposed, only the *Vividness* effect was found to be significant ( $F(1.88, 524.96) = 18.92$ ;  $p < 0.01$ ;  $\eta_p^2 = 0.06$ ). Contrast (Table 6.f) comparing *high* (AR)

and low (IMG) levels of *Vividness* to the mid (VID) level of *Vividness* revealed that both high ( $F(1,279)=4.24$ ;  $p<0.05$ ;  $r=0.12$ ) and low ( $F(1,279)=44.03$ ;  $p<0.001$ ;  $r=0.37$ ) levels of *Vividness* were significantly more *Informative* than mid level of *Vividness*. Neither *SBDP* ( $F(3,279)=0.27$ ; ns) nor *Product Involvement* ( $F(1,279)=3.71$ ; ns) were found to be significant.

Two interaction effects were found to be significant for *Informativeness*. These interaction effects were between *Vividness* and *Product Involvement* ( $F(1.88,524.96)=14.71$ ;  $p<0.01$ ;  $\eta_p^2=0.05$ ) and between *Vividness* and the gender covariate ( $F(1.88,524.96)=3.07$ ;  $p<0.05$ ;  $\eta_p^2=0.01$ ). Contrasts were performed to break down these interactions (Table 6.f). Contrasts comparing each level of *Vividness* to mid level *Vividness* across *Product Involvement* revealed significant interaction when comparing high and low *Product Involvement* scores to high level *Vividness* compared to mid level *Vividness* ( $F(1,279)=21.15$ ;  $p<0.01$ ;  $r=0.27$ ), while no significant interactions were found for low level *Vividness* compared to mid level *Vividness*. Contrasts comparing each level of *Vividness* to mid level *Vividness* across *Gender* revealed significant interaction when comparing male and female scores to low level *Vividness* compared to mid level *Vividness* ( $F(1,279)=6.73$ ;  $p<0.01$ ;  $r=0.15$ ), while no significant interaction was found for high level *Vividness* compared to mid level *Vividness*. Figure 6.i shows the mean plot of  $I_{ad}$  versus *ad Vividness*.

Table 6.e: Mixed Design ANCOVA Results for *Informativeness*.

| Source                                   | Type III Sum of Squares | df     | Mean Square | F       | Sig.  | Partial $\eta^2$ |
|--|-------------------------|--------|-------------|---------|-------|------------------|
| <b>Tests of Within-Subjects Effects</b>  |                         |        |             |         |       |                  |
| Vividness                                | 42.34                   | 1.88   | 22.50       | 18.92   | <0.01 | 0.06             |
| Vividness * Product                      | 32.91                   | 1.88   | 17.49       | 14.71   | <0.01 | 0.05             |
| Vividness * stage                        | 5.38                    | 5.65   | 0.95        | 0.80    | 0.56  | 0.01             |
| Vividness * stage * Product              | 3.07                    | 5.65   | 0.55        | 0.46    | 0.83  | 0.01             |
| Vividness * gender                       | 6.88                    | 1.88   | 3.66        | 3.07    | <0.05 | 0.01             |
| Error(Vividness)                         | 624.42                  | 524.96 | 1.19        |         |       |                  |
| <b>Tests of Between-Subjects Effects</b> |                         |        |             |         |       |                  |
| Intercept                                | 11592.27                | 1      | 11592.27    | 5436.27 | <0.01 | 0.95             |
| gender                                   | 2.11                    | 1      | 2.11        | 0.99    | 0.32  | 0.00             |
| stage                                    | 1.71                    | 3      | 0.57        | 0.27    | 0.85  | 0.00             |
| Product                                  | 7.90                    | 1      | 7.90        | 3.71    | 0.06  | 0.01             |
| stage * Product                          | 0.74                    | 3      | 0.25        | 0.12    | 0.95  | 0.00             |
| Error                                    | 594.94                  | 279    | 2.13        |         |       |                  |

Table 6.f: Tests of Within-Subjects Contrasts for Informativeness.

| Source                      | Vividness    | Type III Sum of Squares | Df  | Mean Square | F     | Sig.  | r    |
|-----------------------------|--------------|-------------------------|-----|-------------|-------|-------|------|
| Vividness                   | High vs. Mid | 11.83                   | 1   | 11.83       | 4.24  | 0.04  | 0.12 |
|                             | Low vs. Mid  | 83.01                   | 1   | 83.01       | 44.03 | <0.01 | 0.37 |
| Vividness * gender          | High vs. Mid | 7.177                   | 1   | 7.18        | 2.57  | 0.11  | 0.10 |
|                             | Low vs. Mid  | 12.68                   | 1   | 12.68       | 6.73  | <0.01 | 0.15 |
| Vividness * stage           | High vs. Mid | 7.45                    | 3   | 2.48        | 0.89  | 0.45  | 0.06 |
|                             | Low vs. Mid  | 4.68                    | 3   | 1.56        | 0.83  | 0.48  | 0.05 |
| Vividness * Product         | High vs. Mid | 59.07                   | 1   | 59.07       | 21.15 | <0.01 | 0.27 |
|                             | Low vs. Mid  | 2.53                    | 1   | 2.53        | 1.34  | 0.25  | 0.07 |
| Vividness * stage * Product | High vs. Mid | 2.01                    | 3   | 0.67        | 0.24  | 0.87  | 0.03 |
|                             | Low vs. Mid  | 1.22                    | 3   | 0.41        | 0.22  | 0.89  | 0.03 |
| Error(Vividness)            | High vs. Mid | 779.18                  | 279 | 2.79        |       |       | 0.12 |
|                             | Low vs. Mid  | 526.04                  | 279 | 1.89        |       |       |      |

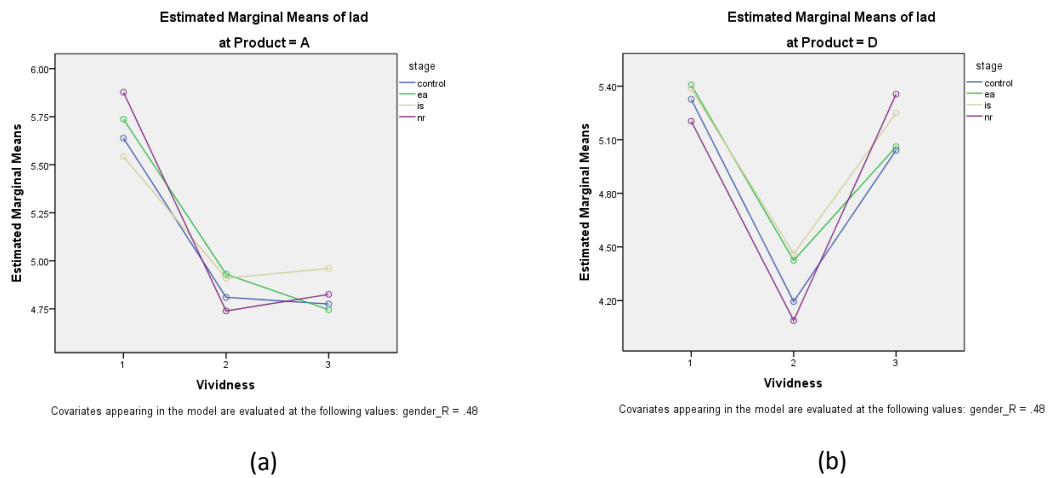


Figure 6.i: Informativeness in Different Levels of Vividness, SBDP and Product Involvement. Low(1), Mid(2) and High(3).

### 6.5.2 Effects on Time Spent Viewing Ad

Hypothesis Two tests whether advertisement *Vividness*, *SBDP* and *Product Involvement* has an effect on the time users spent viewing the advertisement  $T_{ad}$ . Hypothesis H2 states that:

*H2. Vividness has an effect on Time Spent Viewing Ad in different Stages of Buyer Decision Process and different levels of Product Involvement.*

Mixed design ANCOVA was used to test this hypothesis (Table 6.g). Mauchly's Sphericity test showed that Sphericity was not assumed for  $I_{ad}$  ( $p < 0.01$ ), therefore Greenhouse-Geisser correction was used. Results for the main effects were significant for *Vividness* ( $F(1.40, 390.62) = 135.13$ ;  $p < 0.01$ ;  $\eta_p^2 = 0.33$ ) and *Product Involvement* ( $F(1, 279) = 99.66$ ;  $p < 0.01$ ;  $\eta_p^2 = 0.26$ ). The covariate *Gender* ( $F(1, 279) = 14.29$ ;  $p < 0.01$ ;

$\eta_p^2=0.33$ ) was also found to be significant. Contrasts comparing *high* (AR) and *low* (IMG) levels of *Vividness* to *themid* (VID) level of *Vividness* showed that both *high* ( $F(1,279)=26.86$ ;  $p<0.01$ ;  $r=0.30$ ) and *low* ( $F(1,279)=304.89$ ;  $p<0.01$ ;  $r=0.72$ ) levels of *Vividness* were significant, showing a positive linear relationship between *Vividness* and  $T_{ad}$  ( $F=200.32$ ;  $p<0.01$ ;  $\eta_p^2=0.42$ ). This linear relationship is observed in Figure 6.j showing the mean plot of  $T_{ad}$  versus *ad Vividness.SBDP* ( $F(3,279)=0.08$ ;  $ns$ ) was found not to be significant.

Two interaction effects were found to be significant for  $T_{ad}$  between *Vividness* and *Product Involvement* ( $F(1.40,390.62)=10.77$ ;  $p<0.01$ ;  $\eta_p^2=0.04$ ) and between *Vividness* and the *Gender* covariate ( $F(1.40,390.62)=16.70$ ;  $p<0.01$ ;  $\eta_p^2=0.06$ ). Contrasts were performed to break down these interactions (Table 6.h). Contrasts comparing each level of *Vividness* to *mid* level *Vividness* across *Product Involvement* revealed significant interactions when comparing *high* and *low* *Product Involvement* scores to *high* level *Vividness* compared to *mid* level *Vividness* ( $F(1,279)=26.86$ ;  $p<0.01$ ;  $r=0.30$ ) and to *low* level *Vividness* compared to *mid* level *Vividness* ( $F(1,279)=304.89$ ;  $p<0.01$ ;  $r=0.72$ ). Contrast comparing each level of *Vividness* to *mid* level *Vividness* across *Gender* revealed significant interactions when comparing *male* and *female* scores to *high* level *Vividness* compared to *mid* level *Vividness* ( $F(1,279)=22.59$ ;  $p<0.01$ ;  $r=0.27$ ) and to *low* level *Vividness* compared to *mid* level *Vividness* ( $F(1,279)=4.11$ ;  $p<0.05$ ;  $r=0.12$ ).

Table 6.g: Mixed Design ANCOVA Results for Time Spent Viewing Ad.

| Source                                   | Type III Sum of Squares | df      | Mean Square | F       | Sig.  | Partial $\eta^2$ |
|--|-------------------------|---------|-------------|---------|-------|------------------|
| <b>Tests of Within-Subjects Effects</b>  |                         |         |             |         |       |                  |
| Vividness                                | 21839.67                | 1.400   | 15598.89    | 135.13  | <0.01 | .33              |
| Vividness * stage                        | 277.12                  | 4.200   | 65.98       | 0.57    | 0.69  | .01              |
| Vividness * Product                      | 1740.72                 | 1.400   | 1243.30     | 10.77   | <0.01 | .04              |
| Vividness * stage * Product              | 941.08                  | 4.200   | 224.05      | 1.94    | 0.10  | .02              |
| Vividness * gender                       | 2699.77                 | 1.400   | 1928.30     | 16.70   | <0.01 | .06              |
| Error(Vividness)                         | 45093.44                | 390.622 | 115.44      |         |       |                  |
| <b>Tests of Between-Subjects Effects</b> |                         |         |             |         |       |                  |
| Intercept                                | 362343.55               | 1       | 362343.55   | 2124.09 | <0.01 | .88              |
| Stage                                    | 41.22                   | 3       | 13.74       | 0.08    | 0.97  | .00              |
| Product                                  | 17001.53                | 1       | 17001.53    | 99.66   | <0.01 | .26              |
| stage * Product                          | 661.45                  | 3       | 220.48      | 1.29    | 0.28  | .01              |
| Gender                                   | 2437.85                 | 1       | 2437.85     | 14.29   | <0.01 | .05              |
| Error                                    | 47593.95                | 279     | 170.59      |         |       |                  |

Table 6.h: Tests of Within-Subjects Contrasts for  $T_{ad}$ .

| Source                      | Vividness    | Type III Sum of Squares | df  | Mean Square | F      | Sig.  | r    |
|-----------------------------|--------------|-------------------------|-----|-------------|--------|-------|------|
| Vividness                   | High vs. Mid | 5798.94                 | 1   | 5798.94     | 26.86  | <0.01 | 0.30 |
|                             | Low vs. Mid  | 17024.56                | 1   | 17024.56    | 304.89 | <0.01 | 0.72 |
| Vividness * gender          | High vs. Mid | 4877.93                 | 1   | 4877.93     | 22.59  | <0.01 | 0.27 |
|                             | Low vs. Mid  | 229.29                  | 1   | 229.29      | 4.11   | <0.05 | 0.12 |
| Vividness * stage           | High vs. Mid | 225.67                  | 3   | 75.22       | 0.35   | 0.79  | 0.04 |
|                             | Low vs. Mid  | 245.13                  | 3   | 81.71       | 1.46   | 0.23  | 0.07 |
| Vividness * Product         | High vs. Mid | 3478.33                 | 1   | 3478.33     | 16.11  | <0.01 | 0.23 |
|                             | Low vs. Mid  | 781.76                  | 1   | 781.76      | 14.00  | <0.01 | 0.22 |
| Vividness * stage * Product | High vs. Mid | 984.73                  | 3   | 328.24      | 1.52   | 0.21  | 0.07 |
|                             | Low vs. Mid  | 143.87                  | 3   | 47.96       | 0.86   | 0.46  | 0.06 |
| Error(Vividness)            | High vs. Mid | 60236.96                | 279 | 215.90      |        |       |      |
|                             | Low vs. Mid  | 5798.94                 | 279 | 55.84       |        |       |      |

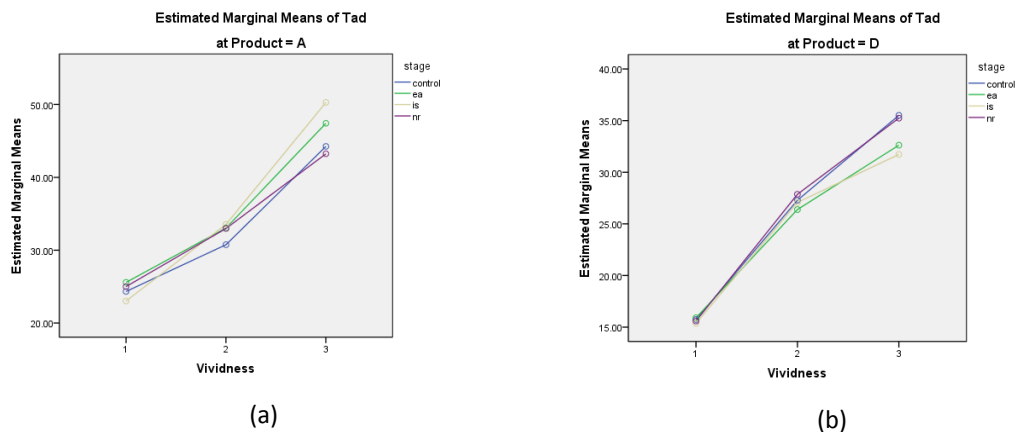


Figure 6.j: Time Spent Viewing Advertisement for Different Levels of Vividness, SBDP and Product Involvement. Low(1), Mid(2) and High(3).

### 6.5.3 Effects on Recall

This section examines the construct *Recall*, made up of two different constructs - *Information Recall* ( $I_r$ ) and *Brand Recall* ( $B_r$ ). These two constructs were analysed individually, first, on how advertisement *Vividness*, *SBDP* and *Product Involvement* affects them, and then determining whether there was a relationship between *Time Spent Viewing Ad* ( $T_{ad}$ ) and the two recall constructs,  $I_r$  and  $B_r$ .

Hypothesis 2a tests whether advertisement *Vividness*, *SBDP* and *Product Involvement* had an effect on *Information Recall* ( $I_r$ ). Hypothesis H2a states that:

*H2a. Vividness has an effect on Information Recall in different Stages of Buyer Decision Process and different levels of Product Involvement.*

Factorial ANCOVA was used to test this hypothesis (Table 6.i). Only data from the first advertisement viewed for each experiment were used for analysis of  $I_r$ . This was to avoid compounding effects due to the repeated measures design of the experiment. Results for main effects were significant for *Vividness* ( $F(1,263)=3.62$ ;  $p<0.05$ ;  $\eta_p^2=0.03$ ) and *Product Involvement* ( $F(1,263)=11.84$ ;  $p<0.01$ ;  $\eta_p^2=0.04$ ). Figure 6.k revealed that as *Vividness* increases,  $I_r$  decreases for *highProduct Involvement* however, no relationship was apparent for *low Product Involvement*.

One interaction effects was found to be significant for  $I_r$  between *SBDP* and *Product Involvement* ( $F(3,263)=10.77$ ;  $p<0.05$ ;  $\eta_p^2=0.03$ ). Figure 6.k(a) revealed that for *high Product Involvement*, as advertisement *Vividness* increases,  $I_r$  decreases for all *SBDP* except for the *control* scenario, where users were not conditioned to any *SBDP*. Figure 6.k shows the mean plot of  $I_r$  versus ad *Vividness*.

Table 6.i: Factorial ANCOVA Results for Information Recall.

| Source                                   | Type III Sum of Squares | df  | Mean Square | F      | Sig.  | Partial $\eta^2$ |
|--|-------------------------|-----|-------------|--------|-------|------------------|
| <b>Tests of Between-Subjects Effects</b> |                         |     |             |        |       |                  |
| Corrected Model                          | 3.50 <sup>a</sup>       | 24  | 0.15        | 2.11   | <0.01 | 0.16             |
| Intercept                                | 20.61                   | 1   | 20.61       | 298.29 | <0.01 | 0.53             |
| Vividness                                | 0.50                    | 2   | 0.25        | 3.62   | <0.05 | 0.03             |
| Stage                                    | 0.12                    | 3   | 0.04        | 0.55   | 0.65  | 0.01             |
| Product                                  | 0.82                    | 1   | 0.82        | 11.84  | <0.01 | 0.04             |
| Gender                                   | 0.18                    | 1   | 0.18        | 2.55   | 0.11  | 0.01             |
| Vividness * Stage                        | 0.59                    | 6   | 0.10        | 1.42   | 0.21  | 0.03             |
| Vividness * Product                      | 0.10                    | 2   | 0.05        | 0.74   | 0.48  | 0.01             |
| Stage * Product                          | 0.56                    | 3   | 0.19        | 2.70   | <0.05 | 0.03             |
| Vividness * Stage * Product              | 0.59                    | 6   | 0.10        | 1.43   | 0.20  | 0.03             |
| Error                                    | 18.17                   | 263 | 0.07        |        |       |                  |
| Total                                    | 67.32                   | 288 |             |        |       |                  |
| Corrected Total                          | 21.67                   | 287 |             |        |       |                  |

a. R Squared = .162 (Adjusted R Squared = .085)

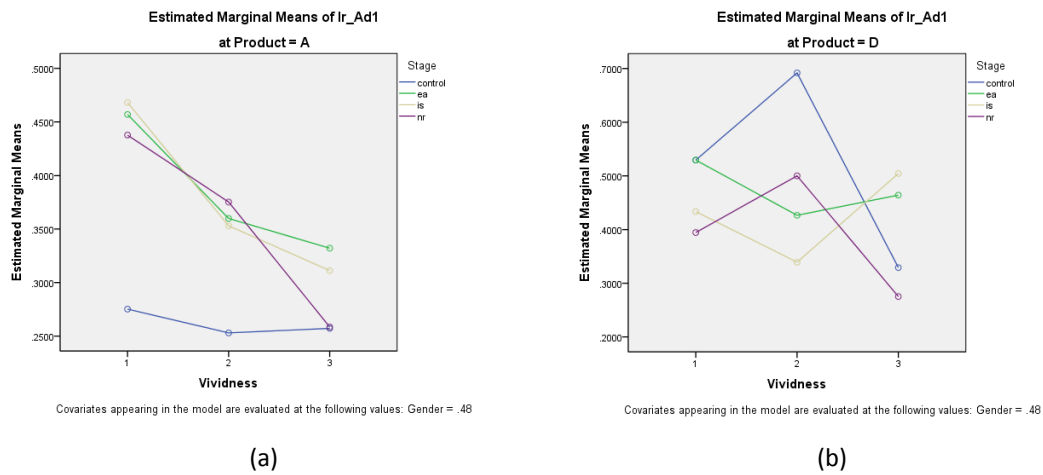


Figure 6.k: Information Recall of Ad1 for Different Levels of Vividness, SBDP and Product Involvement. Low(1), Mid(2) and High(3).

Hypothesis 2.1 tests whether the amount of time users spent viewing the ad ( $T_{ad}$ ) affects the amount of information users can recall from viewing the ad ( $I_r$ ). Hypothesis H2.1 states that:

*H2.1. There is a relationship between Time Spent Viewing the Ad with the level of Information Recall.*

Simple linear regressions were used to test this hypothesis (Table 6.j). Only data from the first advertisement viewed for each experiment were used for analysis of  $I_r$ . Again, this was to avoid any compounding effects due to the repeated measures design of the experiment. No significant results were found for  $T_{ad}$  in general ( $t=-1.25$ ;  $ns$ ),  $T_{ad}$  for image ad ( $t=-0.13$ ;  $ns$ ),  $T_{ad}$  for video ad ( $t=-0.63$ ;  $ns$ ) and  $T_{ad}$  for AR ad ( $t=0.96$ ;  $ns$ ).

Table 6.j: Simple Linear Regression Analysis for  $I_r$

| Variables          | N   | B    | SE(B) | $\beta$ | t     | F    | Sig. | R2   |
|--------------------|-----|------|-------|---------|-------|------|------|------|
| $T_{ad1\_General}$ | 288 | 0.00 | 0.00  | -0.07   | -1.25 | 1.57 | 0.21 | 0.07 |
| $T_{ad1\_IMG}$     | 96  | 0.00 | 0.00  | -0.01   | -0.13 | 0.02 | 0.90 | 0.01 |
| $T_{ad1\_VID}$     | 96  | 0.00 | 0.01  | -0.07   | -0.63 | 0.40 | 0.53 | 0.07 |
| $T_{ad1\_AR}$      | 96  | 0.00 | 0.00  | 0.10    | 0.96  | 0.92 | 0.34 | 0.10 |

Hypothesis 2b tests whether advertisement vividness and the type of product affect users' ability to recall the brand in the advertisement. Hypothesis H2b states that:

*H2b. Vividness has an effect on Brand Recall in different levels of Product Involvement.*



Brand recall was recorded using a binary format - '0' for not recalling correctly or not sure and '1' for correctly recalling the brand in the advertisement. Hence, nonparametric tests were used to test this hypothesis (Table 6.k). The mean between the three degrees of *Vividness* and *high* and *lowProduct Involvement* were significantly different ( $p<0.01$ ). Comparing the combination of *Vividness* for both *high* and *low* Product Involvement showed significant differences between the means of image advertisement vs. video advertisement ( $p<0.05$ ) and image advertisement vs. AR advertisement ( $p<0.01$ ). No significant difference between the means was found for video advertisement vs. AR advertisement.

Breaking down *Product Involvement* into *high* and *lowProduct Involvement* only showed significant results when comparing the means of the three degrees of *Vividness* ( $p<0.05$ ) and image advertisement vs. AR advertisement ( $p<0.01$ ) for *high Product Involvement* and image advertisement vs. video advertisement ( $p<0.05$ ) for *low Product Involvement*.

Table 6.k: Results from Nonparametric Tests Used in Determining the Effect of Vividness and Product Involvement on Brand Recall

| Br           | Product Involvement | Test   | Sig.  |
|--------------|---------------------|--|-------|
| IMG, VID, AR | High and Low        | Related-Samples Friedman's Two-Way Analysis of Variance by Ranks | <0.01 |
| IMG, VID     | High and Low        | Related-Samples Wilcoxon Signed Rank Test                        | <0.05 |
| IMG, AR      | High and Low        | Related-Samples Wilcoxon Signed Rank Test                        | <0.01 |
| VID, AR      | High and Low        | Related-Samples Wilcoxon Signed Rank Test                        | 0.24  |
| IMG, VID, AR | High                | Related-Samples Cochran's Q Test                                 | <0.05 |
| IMG, VID     | High                | Related-Samples McNemar Test                                     | 0.50  |
| IMG, AR      | High                | Related-Samples McNemar Test                                     | <0.01 |
| VID, AR      | High                | Related-Samples McNemar Test                                     | 0.10  |
| IMG, VID, AR | Low                 | Related-Samples Cochran's Q Test                                 | 0.05  |
| IMG, VID     | Low                 | Related-Samples McNemar Test                                     | <0.05 |
| IMG, AR      | Low                 | Related-Samples McNemar Test                                     | 0.07  |
| VID, AR      | Low                 | Related-Samples McNemar Test                                     | 0.88  |

Hypothesis 2.2 tests whether time spent viewing an advertisement has any affects on recalling the brand featured in the advertisement. Hypothesis H2.2 states that:

*H2.2. There is a relationship between Time Spent Viewing the Ad with the level of Brand Recall.*

Simple logistic regressions were used to test this hypothesis (Table 6.l). Significant relationships were found for the image advertisement ( $\chi^2=5.49$ ;  $p<0.05$ ;  $R^2=0.03$ ) and the video ad ( $\chi^2=4.18$ ;  $p<0.05$ ;  $R^2=0.02$ ) but was not found for the AR ad ( $\chi^2=0.218$ ;  $ns$ ;  $R^2=0.00$ ).

Table 6.l: Logistic Regression Results for Brand Recall

|                 |                  | 95% CI for Odds Ratio |            |       | R <sup>2</sup>    |             |            | Model           |
|-----------------|------------------|-----------------------|------------|-------|-------------------|-------------|------------|-----------------|
|                 | B (SE)           | Lower                 | Odds Ratio | Upper | Hosner & Lemeshow | Cox & Snell | Nagelkerke | χ <sup>2</sup>  |
| Image Ad        |                  |                       |            |       |                   |             |            |                 |
| Included        |                  |                       |            |       |                   |             |            |                 |
| Constant        | 1.317* (0.326)   |                       |            |       |                   |             |            |                 |
| T <sub>ad</sub> | -0.034** (0.015) | 0.939                 | 0.966      | 0.994 | 0.015             | 0.019       | 0.027      | 5.488 (0.018)** |
| Video Ad        |                  |                       |            |       |                   |             |            |                 |
| Included        |                  |                       |            |       |                   |             |            |                 |
| Constant        | 1.369** (0.535)  |                       |            |       |                   |             |            |                 |
| T <sub>ad</sub> | -0.035** (0.017) | 0.934                 | 0.966      | 0.999 | 0.011             | 0.014       | 0.019      | 4.184 (0.041)** |
| AR Ad           |                  |                       |            |       |                   |             |            |                 |
| Included        |                  |                       |            |       |                   |             |            |                 |
| Constant        | 0.271 (0.280)    |                       |            |       |                   |             |            |                 |
| T <sub>ad</sub> | -0.003 (0.006)   | 0.985                 | 1.165      | 1.009 | 0.001             | 0.001       | 0.001      | 0.218 (0.640)   |

\*  $p<.01$ , \*\*  $p<.05$

#### 6.5.4 Effects on Attitude toward the Advertisement

Hypothesis Three identifies whether *Vividness*, *SBDP* and *Product Involvement* has any effect on *Attitude Toward the Ad* ( $A_{ad}$ ). Hypothesis H3 states that:

*H3. Vividness has an effect on Attitude Toward the Ad in different Stages of Buyer Decision Process and different levels of Product Involvement.*

Mixed design ANCOVA was used to test this hypothesis (Table 6.m). Mauchly's Sphericity test showed that Sphericity was assumed for  $I_{ad}$  ( $p>0.05$ ). Results for main effects was significant for *Vividness* ( $F(2,558)=47.82$ ;  $p<0.01$ ;  $\eta_p^2=0.15$ ). Contrast comparing *high* and *low* levels of *Vividness* to *mid* level of *Vividness* revealed that *high* level *Vividness* was significant ( $F(1,279)=64.43$ ;  $p<0.01$ ;  $r=0.430$ ) but *low* level *Vividness* was not ( $F(1,279)=1.35$ ;  $ns$ ). *SBDP* ( $F(3,279)=0.24$ ;  $ns$ ) and *Product Involvement* ( $F(1,279)=2.03$ ;  $ns$ ) were found not to be significant.

Two interaction effects were found to be significant for  $A_{ad}$  between *Vividness* and *Product Involvement* ( $F(2,558)=9.12$ ;  $p<0.01$ ;  $\eta_p^2=0.03$ ) and between *Vividness* with *Gender* covariate ( $F(2,558)=5.20$ ;  $p<0.01$ ;  $\eta_p^2=0.02$ ). Contrasts were performed to break down these interactions (Table 6.n). Contrasts comparing each level of *Vividness* to *mid* level *Vividness* across *Product Involvement* revealed significant interactions when comparing *high* and *low* *Product Involvement* scores to *high* level *Vividness* compared to *mid* level *Vividness* ( $F(1,279)=11.34$ ;  $p<0.01$ ;  $r=0.20$ ) but not for *low* level *Vividness* compared to *mid* level *Vividness* ( $F(1,279)=0.54$ ; *ns*). Contrasts comparing each level of *Vividness* to *mid* level *Vividness* across *Gender* revealed significant interactions when comparing *male* and *female* scores to *high* level *Vividness* compared to *mid* level *Vividness* ( $F(1,279)=9.62$ ;  $p<0.01$ ;  $r=0.18$ ) and to *low* level *Vividness* compared to *mid* level *Vividness* ( $F(1,279)=6.51$ ;  $p<0.05$ ;  $r=.15$ ). Figure 6.1 shows the mean plot of  $A_{ad}$  versus advertisement *Vividness*.

Table 6.m: Mixed Designed ANCOVA Results for  $A_{ad}$

| Source                                   | Type III Sum of Squares | df  | Mean Square | F       | Sig.  | Partial $\eta^2$ |
|--|-------------------------|-----|-------------|---------|-------|------------------|
| <b>Tests of Within-Subjects Effects</b>  |                         |     |             |         |       |                  |
| Vividness                                | 158.88                  | 2   | 79.44       | 47.82   | <0.01 | 0.15             |
| Vividness * stage                        | 5.77                    | 6   | 0.96        | 0.58    | 0.75  | 0.01             |
| Vividness * Product                      | 30.30                   | 2   | 15.15       | 9.12    | <0.01 | 0.03             |
| Vividness * stage * Product              | 11.16                   | 6   | 1.86        | 1.12    | 0.35  | 0.01             |
| Vividness * gender                       | 17.27                   | 2   | 8.63        | 5.20    | <0.01 | 0.02             |
| Error(Vividness)                         | 927.02                  | 558 | 1.66        |         |       |                  |
| <b>Tests of Between-Subjects Effects</b> |                         |     |             |         |       |                  |
| Intercept                                | 9414.99                 | 1   | 9414.99     | 4798.57 | <0.01 | 0.95             |
| stage                                    | 1.39                    | 3   | 0.46        | 0.24    | 0.87  | 0.00             |
| Product                                  | 3.99                    | 1   | 3.99        | 2.03    | 0.16  | 0.01             |
| stage * Product                          | 4.79                    | 3   | 1.60        | 0.81    | 0.49  | 0.01             |
| gender                                   | 6.03                    | 1   | 6.03        | 3.07    | 0.08  | 0.01             |
| Error                                    | 547.41                  | 279 | 1.96        |         |       |                  |

Table 6.n: Tests of Within-Subjects Contrasts for  $A_{ad}$

| Source                      | Vividness    | Type III Sum of Squares | df  | Mean Square | F     | Sig.  | r    |
|-----------------------------|--------------|-------------------------|-----|-------------|-------|-------|------|
| Vividness                   | High vs. Mid | 204.99                  | 1   | 204.99      | 64.43 | <0.01 | 0.43 |
|                             | Low vs. Mid  | 4.15                    | 1   | 4.15        | 1.35  | 0.25  | 0.07 |
| Vividness * gender          | High vs. Mid | 30.62                   | 1   | 30.62       | 9.62  | <0.01 | 0.18 |
|                             | Low vs. Mid  | 20.07                   | 1   | 20.07       | 6.51  | <0.01 | 0.15 |
| Vividness * stage           | High vs. Mid | 2.05                    | 3   | 0.68        | 0.22  | 0.89  | 0.03 |
|                             | Low vs. Mid  | 7.29                    | 3   | 2.43        | 0.79  | 0.50  | 0.05 |
| Vividness * Product         | High vs. Mid | 36.09                   | 1   | 36.09       | 11.34 | <0.01 | 0.20 |
|                             | Low vs. Mid  | 1.65                    | 1   | 1.65        | 0.54  | 0.47  | 0.04 |
| Vividness * stage * Product | High vs. Mid | 3.46                    | 3   | 1.15        | 0.36  | 0.78  | 0.04 |
|                             | Low vs. Mid  | 9.67                    | 3   | 3.22        | 1.05  | 0.37  | 0.06 |
| Error(Vividness)            | High vs. Mid | 887.71                  | 279 | 3.18        |       |       |      |
|                             | Low vs. Mid  | 859.58                  | 279 | 3.08        |       |       |      |

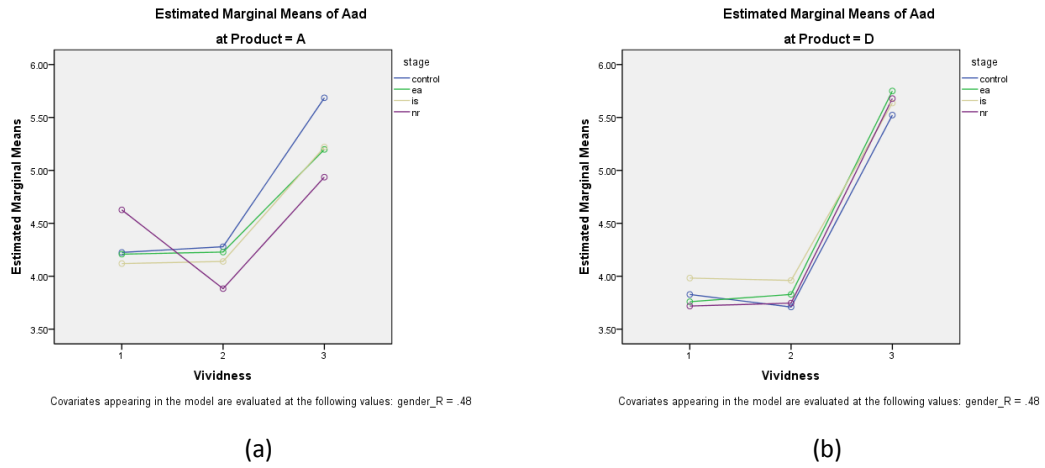


Figure 6.1: Attitude Toward the Ad for Different Levels of Vividness, SBDP and Product Involvement. Low(1), Mid(2) and High(3).

Hypothesis 3.1 tests whether attitude toward the advertisement had any affect on recalling the brand featured in the advertisement. Hypothesis H3.1 states that:

*H3.1. There is a relationship between Attitude Toward the Ad and Brand Recall.*

Simple logistic regressions were used on the three degrees of advertisement vividness to test this hypothesis (Table 6.o). No significant relationships were found for image advertisement ( $\chi^2=2.30$ ; *ns*;  $R^2=0.01$ ), video advertisement ( $\chi^2=0.01$ ; *ns*) and AR advertisement ( $\chi^2=0.36$ ; *ns*).

Table 6.o: Logistic Regression Results for B<sub>i</sub> in Different Levels of Ad Vividness

|                     |              | 95% CI for Odds Ratio |            |       | R <sup>2</sup>    |             |            | Model        |
|---------------------|--------------|-----------------------|------------|-------|-------------------|-------------|------------|--------------|
|                     | B (SE)       | Lower                 | Odds Ratio | Upper | Hosner & Lemeshow | Cox & Snell | Nagelkerke | $\chi^2$ (p) |
| Image Ad            |              |                       |            |       |                   |             |            |              |
| Included            |              |                       |            |       |                   |             |            |              |
| Constant            | 1.41 (0.10)  |                       |            |       |                   |             |            |              |
| A <sub>ad_IMG</sub> | -0.15 (0.44) | 0.70                  | 0.86       | 1.05  | 0.002             | 0.08        | 0.01       | 2.30 (0.13)  |
| Video Ad            |              |                       |            |       |                   |             |            |              |
| Included            |              |                       |            |       |                   |             |            |              |
| Constant            | 0.28 (0.36)  |                       |            |       |                   |             |            |              |
| A <sub>ad_VID</sub> | 0.01 (0.09)  | 0.85                  | 1.01       | 1.20  | 0.003             | 0.00        | 0.00       | 0.01 (0.91)  |
| AR Ad               |              |                       |            |       |                   |             |            |              |
| Included            |              |                       |            |       |                   |             |            |              |
| Constant            | -0.12 (0.47) |                       |            |       |                   |             |            |              |
| A <sub>ad_AR</sub>  | 0.05 (0.08)  | 0.89                  | 1.05       | 1.24  | 0.003             | 0.00        | 0.00       | 0.36 (0.55)  |

\*  $p < .01$ , \*\*  $p < .05$

Hypothesis 3.2a tests whether attitude toward the advertisement ( $A_{ad}$ ) affects attitude toward the actual brand viewed ( $A_{b(actual)}$ ). Hypothesis H3.2a states that:

*H3.2a. There is a relationship between Attitude Toward the Ad and Attitude toward the Actual Brand.*

Three separate simple linear regressions were used to test this hypothesis (Table 6.p) on the three degrees of advertisement vividness, *low* (image), *mid*, (video) and *high* (AR). Analysis found that an increase in attitude toward the advertisement increases attitude toward the actual brand for *highly* vivid advertisements ( $t=2.35$ ;  $p<0.05$ ). The effect size was found to be 0.02 which denotes a small effect size based on Cohen's (1988) conventions. No significant differences were found for *low* vivid ( $t=0.64$ ; *ns*) and *mid* vivid ( $t=1.85$ ; *ns*) advertisements.

Table 6.p: Simple Linear Regression Analysis for  $A_{b(actual)}$

| Variables            | N   | B    | SE(B) | $\beta$ | <i>t</i> | F    | Sig.  | R <sup>2</sup> |
|----------------------|-----|------|-------|---------|----------|------|-------|----------------|
| A <sub>ad</sub> _IMG | 288 | 0.38 | 0.59  | 0.04    | 0.64     | 0.41 | 0.52  | 0.00           |
| A <sub>ad</sub> _VID | 288 | 0.97 | 0.52  | 0.11    | 1.85     | 3.42 | 0.07  | 0.01           |
| A <sub>ad</sub> _AR  | 288 | 1.13 | 0.48  | 0.14    | 2.35     | 5.50 | <0.05 | 0.02           |

Hypothesis 3.2b tests whether attitude toward the advertisement ( $A_{ad}$ ) affects attitude toward the perceived brand viewed ( $A_{b(perceived)}$ ). Hypothesis H3.2b states that:

*H3.2b. There is a relationship between Attitude Toward the Ad and Attitude toward the Perceived Brand.*

Three separate simple linear regressions were used to test this hypothesis (Table 6.q) on the three degrees of advertisement vividness, *low* (image), *mid*, (video) and *high* (AR). Analysis found that an increase in attitude toward the advertisement increases attitude toward the actual brand for *mid* vivid advertisements ( $t=2.35$ ;  $p<0.05$ ). The effect size was found to be 0.02 which denotes a small effect size based on Cohen's (1988) conventions. No significant differences were found for *low* vivid ( $t=1.06$ ; *ns*) and *high* vivid ( $t=1.63$ ; *ns*) advertisements.

Table 6.q: Simple linear regression analysis for  $A_{b(\text{perceived})}$

| Variables            | N   | B    | SE(B) | $\beta$ | t    | F    | Sig.  | R <sup>2</sup> |
|----------------------|-----|------|-------|---------|------|------|-------|----------------|
| A <sub>ad</sub> _IMG | 288 | 0.63 | 0.59  | 0.06    | 1.07 | 1.14 | 0.29  | 0.00           |
| A <sub>ad</sub> _VID | 288 | 1.23 | 0.52  | 0.14    | 2.35 | 5.54 | <0.05 | 0.02           |
| A <sub>ad</sub> _AR  | 288 | 0.89 | 0.55  | 0.11    | 1.63 | 2.67 | 0.10  | 0.01           |

#### 6.5.5 Effects on Attitude Toward Receiving Mobile Phone Ad

Hypothesis 4 tests whether attitude toward the advertisement ( $A_{ad}$ ) affects attitude toward receiving mobile phone advertisements in the future ( $A_{rmAD}$ ). Hypothesis H4 states that:

*H4. There is a relationship between Attitude Toward the Ad and attitude towards Receiving Mobile Phone Ad.*

Simple linear regressions were used to test this hypothesis (Table 6.r) on all levels of advertisement vividness and then on the three individual levels of advertisement vividness, *low* (image), *mid*, (video) and *high* (AR). Analysis found that  $A_{ad}$  had a direct influence on  $A_{rmAD}$  as a whole ( $t=12.60$ ;  $p<0.01$ ). The effect size was found to be 0.16 which denotes a small effect size based on Cohen's (1988) conventions. A breakdown of vividness found significance in all three degrees of vividness, *high* ( $t=12.60$ ;  $p<0.01$ ;  $R^2=0.20$ ), *mid* ( $t=12.60$ ;  $p<0.01$ ;  $R^2=0.10$ ), *low* ( $t=12.60$ ;  $p<0.01$ ;  $R^2=0.09$ ). All three degrees of vividness showed small effect size.

Table 6.r: Simple linear regression analysis for  $A_{rmad}$

| Variables            | N   | B    | SE(B) | $\beta$ | t     | F      | Sig.  | R <sup>2</sup> |
|----------------------|-----|------|-------|---------|-------|--------|-------|----------------|
| A <sub>ad</sub>      | 864 | 0.36 | 0.03  | 0.39    | 12.60 | 158.86 | <0.01 | 0.16           |
| A <sub>ad</sub> _IMG | 288 | 0.31 | 0.06  | 0.30    | 5.26  | 27.64  | <0.01 | 0.09           |
| A <sub>ad</sub> _VID | 288 | 0.31 | 0.06  | 0.32    | 5.67  | 32.12  | <0.01 | 0.10           |
| A <sub>ad</sub> _AR  | 288 | 0.49 | 0.06  | 0.44    | 8.39  | 70.35  | <0.01 | 0.20           |

#### 6.5.6 Novelty effects

*Novelty* is unique to each advertisement; hence t-tests were used for the analysis on each of the three degrees of advertisement vividness instead of incorporating *Novelty* as a covariate in the mixed design ANCOVA analysis.

Hypothesis 5.1 tests whether the individual advertisement novelty ( $N_{eff}$ ) affects the amount of time users spent on viewing the advertisement ( $T_{ad}$ ). Hypothesis H5.1 states that:

*H5.1. Novelty has an effect on Time Spent Viewing Ad.*

The test of homogeneity showed that homogeneity was not violated and equal variances were assumed ( $p > 0.05$ ). Independent samples  $t$ -test (Table 6.s) showed no significant differences in  $T_{ad}$  across the three degrees of advertisement vividness, high ( $t = 0.50$ ,  $ns$ ), mid ( $t = -1.34$ ,  $ns$ ), low ( $t = 0.22$ ,  $ns$ ). Therefore, hypothesis 5.2 was rejected. *Novelty* does not have any effect on time spent viewing the advertisement. Figure 6.m shows the distribution of users finding the different advertisements a novelty.

Table 6.s: T-test Results for  $T_{ad}$  Comparing Novelty Effects

| 6.6           | Novelty | N   | M     | SD    | SE Mean | $t$   | df     | Sig. | $r$  |
|---------------|---------|-----|-------|-------|---------|-------|--------|------|------|
| $T_{ad\_IMG}$ | 0       | 228 | 20.12 | 8.07  | 0.53    | 0.22  | 286.00 | 0.83 | 0.01 |
|               | 1       | 60  | 19.87 | 8.63  | 1.11    |       |        |      |      |
| $T_{ad\_VID}$ | 0       | 240 | 29.64 | 6.14  | 0.40    | -1.34 | 286.00 | 0.18 | 0.08 |
|               | 1       | 48  | 31.00 | 7.73  | 1.12    |       |        |      |      |
| $T_{ad\_AR}$  | 0       | 259 | 40.21 | 17.83 | 1.11    | 0.50  | 286.00 | 0.62 | 0.03 |
|               | 1       | 29  | 38.48 | 15.01 | 2.79    |       |        |      |      |

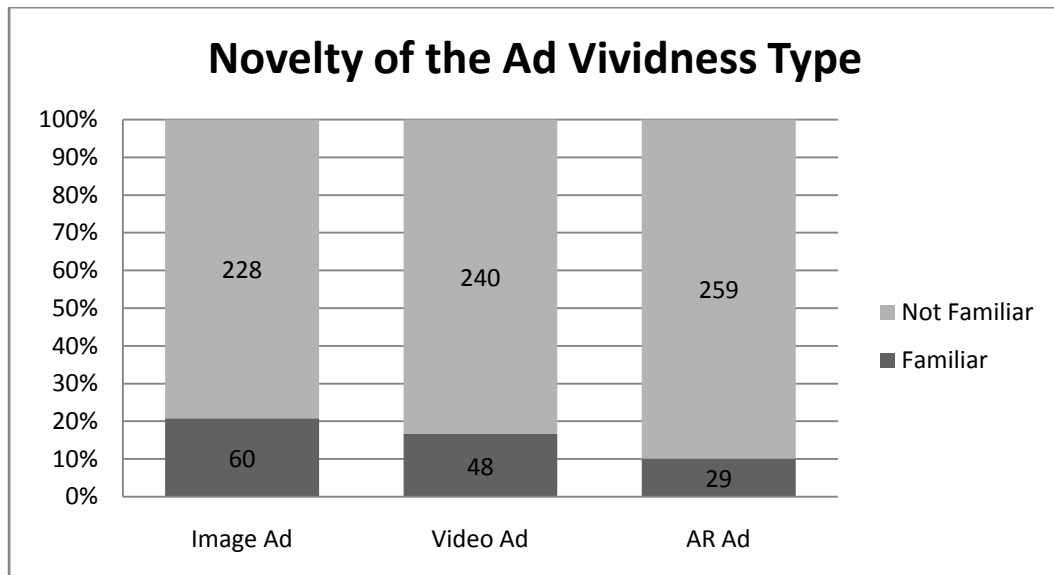


Figure 6.m: Novelty Distribution for Different Levels of Advertisement Vividness

Hypothesis 5.2 tests whether the individual advertisement novelty ( $N_{eff}$ ) affects attitude toward the advertisement viewed ( $A_{ad}$ ). Hypothesis H5.2 states that:

*H5.2. Novelty has an effect on Attitude Toward the Ad.*

Independent samples *t*-test (Table 6.t) showed no significant differences in  $A_{ad}$  across the three degrees of advertisement vividness, *high* ( $t=1.22$ , *ns*), *mid* ( $t=-1.05$ , *ns*), and *low* ( $t=1.05$ , *ns*). Therefore, hypothesis 5.2 was rejected. *Novelty* does not have any effect on attitude toward the ad.

Table 6.t: T-test Results for  $A_{ad}$  Comparing Novelty Effects

|                      | Novelty | N   | M    | SD   | SE Mean | <i>t</i> | df     | Sig. | <i>r</i> |
|----------------------|---------|-----|------|------|---------|----------|--------|------|----------|
| A <sub>ad</sub> _IMG | 0       | 228 | 4.10 | 1.26 | 0.08    | 1.05     | 286.00 | 0.30 | 0.06     |
|                      | 1       | 60  | 3.91 | 1.14 | 0.15    |          |        |      |          |
| A <sub>ad</sub> _VID | 0       | 240 | 3.93 | 1.39 | 0.09    | -1.05    | 286.00 | 0.29 | 0.06     |
|                      | 1       | 48  | 4.16 | 1.32 | 0.19    |          |        |      |          |
| A <sub>ad</sub> _AR  | 0       | 259 | 5.49 | 1.41 | 0.09    | 1.22     | 286.00 | 0.23 | 0.07     |
|                      | 1       | 29  | 5.15 | 1.35 | 0.25    |          |        |      |          |

## 6.6 ANALYSIS OF OPEN-ENDED COMMENTS

Information collected from the optional, open ended comment section of the survey questionnaires can be found in Table 6.u. The comments were grouped into five different categories of *novelty* (user's perceived effect of novelty), *learning curve* (hindrance caused by technology), *informativeness* (the ability to obtain information), *intrusiveness* (intrusion of privacy and space), and *general comments*.

*Novelty* - There were mixed opinions about novelty for the highly vivid advertisements. Novelty may or may not be an attractive feature. It is however, an effect most users agreed could not be maintained.

*Learning curve* - Highly vivid advertisements (AR) requires a learning curve that was perceived as undesirable. Less vivid advertisements that were presented in more familiar formats (image and video) did not pose the same degree of challenge and hence did not share the same undesirable effect.



*Informativeness* - Comments on the low vividness advertisements (image) were positive when it came to the ability to obtain information. Information that was provided immediately was the source of favourable comments. Users found increased vividness in advertisements an unwelcome distraction that did not serve any purpose in providing information.

*Intrusiveness* - An important concern expressed by users was privacy, defined by personal space (receiving advertisements without permission) and physical space (storage space required on mobile for advertisement viewing). Participants perceived less vivid advertisements such as image and video advertisements as push advertisements (unsolicited advertisements sent to the mobile phones of mass audience). This sentiment possibly arises from their experience with advertisements on the Internet, where image advertisements and video advertisements are presented without the users' express permission. Conversely, highly vivid advertisements such as AR advertisements were regarded as opt-in advertisements due to the active involvement required to initiate the advertisement. Users regarded the ability to control participation in the viewing of the advertisement an important element in mobile advertising.

Table 6.u: Categorised Users' Comments

| Theme                                | Vividness  | Quotes  | Orientation                             | Ref. ID  |
|--------------------------------------|--|---|---|----------|
| Novelty                              | Low ( <i>Image</i> )   | -   |   |          |
|                                      | Mid ( <i>Video</i> )   | -   |   |          |
|                                      | High ( <i>AR</i> )   | "I think the novelty would reduce (and with it the appeal) after some use, even as my ability to use it properly improved."   | Negative                                | #7       |
|                                      |  | "I don't really like the interactive ad. May be it is because I have never seen it before."   | Negative                                | #57      |
|                                      |  | "I found the interactive ad quite interesting as it was new to me."   | Positive                                | #74      |
| "... Not sure if novelty will last." |  | Negative  | #73                                     |          |
| Learning Curve                       | Low ( <i>Image</i> )   | -   |   |          |
|                                      | Mid ( <i>Video</i> )   | -   |   |          |
|                                      | High ( <i>AR</i> )   | "The interactive ad was new and unusual, but took some practice to manage."   | Negative                                | #7       |
|                                      |  | "The interactive ad was only unlikable in the fact that it took a while to get the sizing right so the information could be read."  | Negative                                | #10      |
|                                      |  | "very hard to focus with the interactive ad"  | Negative                                | #66      |
| Informativeness                      | Low ( <i>Image</i> )   | "The image ad was alright, it gave me the information quickly."   | Positive                                | #35      |
|                                      |  | "easiest to read in the image ad"   | Positive                                | #46      |
|                                      |  | "Image ad was preferable as the information about the car was easier to see - I'm much more interested in specifications of a product than flashy graphics etc."                                    | Positive                                | #62      |
|                                      |  | "The image ad was straight to the point and very effective."  | Positive                                | #69      |
|                                      |  | "Image ad easier to obtain info. Easier to seek information that is relevant to myself."  | Positive                                | #73      |
|                                      |  | "With the image ad it was easy to focus on the specifics of the beer, even though it was a bit more 'boring'."  | Positive                                | #74      |
|                                      | Mid ( <i>Video</i> )   | "video Ad was a little distracting"   | Negative                                | #28      |
|                                      |  | "I found the video ad to be annoying and hard to read"  | Negative                                | #32      |
|                                      |  | "Video ad effectively wastes time while I am waiting to be able to access the information"  | Negative                                | #4       |
|                                      |  | "Hard to read info on video ad during the moving camera - I found that annoying!"   | Negative                                | #6       |
|                                      |  | "The video ad made me motion sick. It was awful to view and hard to read the information."  | Negative                                | #7       |
|                                      |  | "Video ad doesn't tell much."   | Negative                                | #19      |
|                                      |  | "It was really hard to see the car information in the video ad because it was rotating"   | Negative                                | #21      |
|                                      |  | "...i didn't have enough time to read the information."   | Negative                                | #43      |
|                                      |  | "The video ad was confusing as it was just flipping around and that's all i really remember..."   | Negative                                | #47      |
|                                      |  | "the video advert was annoying to read when it was spinning around and to actually read it i had to wait for it to stop."   | Negative                                | #67      |
|                                      |  | "In the video ad there was way too much happening. I'm guessing the point of it was to gain the consumers interest by being able to see the car from different angles, but for mine it put me off." | Negative                                | #69      |
|                                      |  | "Video ad too flashy. Want information faster than that instead of waiting for info to appear."   | Negative                                | #73      |
|                                      |  | High ( <i>AR</i> )  | "Hindrance towards getting information" | Negative |
|                                      | "Interactive ad actively hinders my ability to consumer the relevant information and does not provide any more |   | Negative                                | #4       |

|               |                      |  |          |     |
|---------------|----------------------|--|----------|-----|
|               |                      | useful information.”   |          |     |
|               |                      | “... was more interested in the interactive aspect of the ad.”   | Negative | #8  |
|               |                      | “interactive ads can be distractive”   | Negative | #25 |
|               |                      | “The interactive ad was good (interesting) as it was very flashy but I totally forgot about the info it gave.”   | Negative | #47 |
|               |                      | “I got a little caught up in the technology and didn't think it was relevant if I was considering purchasing a new car.”   | Negative | #28 |
|               |                      | “...the novelty also made me not pay attention to the specifics about the beer.”   | Negative | #74 |
|               |                      | “...Interactive ad is quite cool. Though not quite as easy to extract relevant information”  | Negative | #73 |
| Intrusiveness | Low ( <i>Image</i> ) | “I'd rather not have anyone send files/videos/images to me for the purpose of advertising products. That fills up my phone memory and I don't really have a choice of whether I want to really see the ad or not. I would have to delete it which is again manual labour.” | Negative | #41 |
|               |                      | “my opinion on the image advert was less favourable due to the fact that receiving these messages via txt message would get rather annoying and; like spam emails, i would likely just delete them if I was not actively searching for a car.”                             | Negative | #67 |
|               | Mid ( <i>Video</i> ) | “I'd rather not have anyone send files/videos/images to me for the purpose of advertising products. That fills up my phone memory and I don't really have a choice of whether I want to really see the ad or not. I would have to delete it which is again manual labour.” | Negative | #41 |
|               |                      | “Not too keen on video/graphical ads on my phone as they may drain battery faster, use more memory etc.”   | Negative | #62 |
|               | High ( <i>AR</i> )   | “Would prefer interactive ad as it is less intrusive. I see the marker in a paper or somewhere else and I can choose to make use of it or not.”  | Positive | #41 |
|               |                      | “I think the interactive advert was more likeable due to the interactivity, and the fact that to view it, you have to proactively start it.”   | Positive | #67 |
|               |                      | “I hate any advertising on my mobile as I see it as an invasion of my privacy.”  | Negative | #20 |
|               | General              | “Personally I am against receiving ads on my mobile phone as I see it as a personal device that only direct contacts should have access to.”   | Negative | #39 |
|               |                      | “Not too keen on video/graphical ads on my phone as they may drain battery faster, use more memory etc.”   | Negative | #62 |
|               |                      | “I would prefer to have the image ad if I had to choose, but find most advertisements annoying, unless there is a new product on the market.”  | Positive | #64 |
| General       | Low ( <i>Image</i> ) | “video ad was pretty cool.”  | Positive | #12 |
|               | Mid ( <i>Video</i> ) | “I like the video ad better because it is animated. It catches attention”  | Positive | #17 |
|               |                      | “The video was needlessly long and a bit boring”   | Negative | #35 |
|               |                      | “did not like the video ad”  | Negative | #46 |
|               |                      | “I like the video ad.”   | Positive | #56 |
|               | High ( <i>AR</i> )   | “I very much dislike the interactive ad, it was very annoying.”  | Negative | #13 |
|               |                      | “Interactive ad was the most enjoyable to view”  | Positive | #46 |
|               |                      | “The interactive ad was extremely interesting. I didn't know that such things were possible with a mobile phone.”  | Positive | #49 |
|               |                      | “Interactive ad was very interesting and fun to use.”  | Positive | #55 |
|               |                      | “I think the interactive advert was more likeable due to the interactivity”  | Positive | #67 |
|               |                      | “Interactive Ads are the best of the 3. You have room to play around as much as you can.”  | Positive | #75 |

## 6.7 OBSERVATIONS

In addition to the core data collected for the main study, users' behaviours during the viewing of the AR advertisements were also recorded as an impromptu part of this study. The impromptu nature of this observation meant that not all 288 users' behaviours were observed during the course of this experiment. This is reflected in the number of participants, *N*, presented in Table 6.v. Observation showed 20.2% of users flipped the phone sideways to have a better view at the advertisement, 10.7% moved the phone around the AR marker, 16.8% moved the AR marker around, 30.6% moved the phone closer and further from the marker to utilise the zoom feature, and 20.4% moved the marker closer to also utilize the zoom feature. The observation data of low adaptation of the AR usability features supported the comments provided by users, stating that novelty in the advertisement is a hindrance to obtaining information.

Table 6.v: Observation of Users' Behaviour When Viewing AR Ad

|  | <b>N</b> | <b>Count</b> | <b>Percentage</b> |
|--|----------|--------------|-------------------|
| Flipped Phone Sideways                           | 213      | 43           | 20.2%             |
| Moved Mobile Phone Around Marker                 | 197      | 21           | 10.7%             |
| Moved Marker Around                              | 197      | 33           | 16.8%             |
| Move Phone Closer and Further From Marker (Zoom) | 160      | 49           | 30.6%             |
| Moved Marker Closer                              | 98       | 20           | 20.4%             |

## 6.8 CHAPTER SUMMARY

The hypotheses proposed in Chapter Four were tested in this chapter through statistical analysis of the data collected. The findings are summarised in Table 6.w, with full discussion of these results presented in Chapter Seven. Limitations of the research and future directions will also be discussed in the following chapter.

Table 6.w: Summary of Hypotheses

|        | Hypothesis   | Test                       | Significant         |                             | Summary             |
|--------|--|----------------------------|---------------------|-----------------------------|---------------------|
|        |  |                            | Results             | Between Vividness           |                     |
| H1.    | Vividness has an effect on Informativeness in different Stages of Buyer Decision Process and different levels of Product Involvement.        | Mix Design ANCOVA          | Vividness           | High vs. Mid<br>Low vs. Mid | Partially Supported |
|        |  |                            | Vividness * Product | High vs. Mid                |                     |
|        |  |                            | Vividness * Gender  | Low vs. Mid                 |                     |
| H2.    | Vividness has an effect on Time Spent Viewing Ad in different Stages of Buyer Decision Process and different levels of Product Involvement.  | Mix Design ANCOVA          | Vividness           | High vs. Mid<br>Low vs. Mid | Partially Supported |
|        |  |                            | Vividness * Product | High vs. Mid<br>Low vs. Mid |                     |
|        |  |                            | Vividness * Gender  | High vs. Mid<br>Low vs. Mid |                     |
|        |  |                            | Product             |                             |                     |
|        |  |                            | Gender              |                             |                     |
| H2a.   | Vividness has an effect on Information Recall in different Stages of Buyer Decision Process and different levels of Product Involvement.     | Factorial ANCOVA           | Vividness           |                             | Partially Supported |
|        |  |                            | Product             |                             |                     |
|        |  |                            | Stage * Product     |                             |                     |
| H2.1.  | There is a relationship between Time Spent Viewing the Ad with Information Recall.   | Simple Linear Regression   |                     |                             | Not supported       |
| H2b.   | Vividness has an effect on Brand Recall in different levels of Product Involvement.  | Nonparametric Test         | IMG, VID, AR        | High and Low                | Partially Supported |
|        |  |                            | IMG, VID            | High and Low                |                     |
|        |  |                            | IMG, AR             | High and Low                |                     |
|        |  |                            | IMG, VID, AR        | High                        |                     |
|        |  |                            | IMG, AR             | High                        |                     |
|        |  |                            | IMG, VID            | Low                         |                     |
| H2.2.  | There is a relationship between Time Spent Viewing the Ad with Brand Recall.   | Simple Logistic Regression | IMG                 |                             | Partially Supported |
|        |  |                            | VID                 |                             |                     |
| H3.    | Vividness has an effect on Attitude Toward the Ad in different Stages of Buyer Decision Process and different levels of Product Involvement. | Mix Design ANCOVA          | Vividness           | High vs. Mid                | Partially Supported |
|        |  |                            | Vividness * Product | High vs. Mid                |                     |
|        |  |                            | Vividness * Gender  | High vs. Mid<br>Low vs. Mid |                     |
| H3.1.  | There is a relationship between Attitude Toward the Ad and Attitude toward the Actual Brand.   | Simple Linear Regression   | AR                  |                             | Partially Supported |
| H3.2a. | There is a relationship between Attitude Toward the Ad and Attitude toward the Perceived Brand.  | Simple Linear Regression   | VID                 |                             | Partially Supported |
| H3.2b. | There is a relationship between Attitude Toward the Ad and Brand Recall.   | Simple Logistic Regression |                     |                             | Not supported       |
| H4     | There is a relationship between Attitude Toward the Ad and Attitude Toward Receiving Mobile Phone Ad.  | Simple Linear Regression   | General             |                             | Supported           |
|        |  |                            | IMG                 |                             |                     |
|        |  |                            | VID                 |                             |                     |
|        |  |                            | AR                  |                             |                     |
| H5.1.  | Novelty has an effect on Time Spent Viewing Ad.  | t-test                     |                     |                             | Not supported       |
| H5.2.  | Novelty has an effect on Attitude Toward the Ad.   | t-test                     |                     |                             | Not supported       |

## Chapter Seven: **DISCUSSION**

### **7.1 INTRODUCTION**

In this chapter, the major findings of this research, the implications arising from these findings, the limitations of the research, and directions for future research in the field of mobile advertising, will be discussed.

### **7.2 MAJOR RESEARCH FINDINGS**

#### ***7.2.1 Summary of Research***

Although the effects of vividness in advertising have been well researched for traditional media, little is known about the role of vividness in advanced digital media, and especially in mobile phone advertising. To address this knowledge gap, this thesis proposed an experimental research framework that examined the role of vividness, consumer goals, and product involvement, on the effectiveness of advertisements delivered through mobile phones. A secondary purpose was to identify potential indicative measures for advertisement effectiveness. The research framework proposed that degree of vividness, the stage of the buyer decision process, and the level of product involvement, affects the effectiveness of advertisements, assessed through measures of level of recall and attitude toward the brand. The amount of time users spent viewing an advertisement was also examined as a potential indicator for measuring the effectiveness of an advertisement. The relationships hypothesised in the conceptual model were tested through an experimental study using a mobile phone that has the various advertisement formats installed. Data for the various dependent variables and covariates were collected through an online survey.

#### ***7.2.2 Main Effects***

##### ***7.2.2.1 Effects of Independent Variables***

This study proposed that different degrees of vividness, user goals (based on their stage in the buyer decision process), and the level of product involvement, affects a user's perceived informativeness of an advertisement, the amount of time the user spent

viewing the advertisement, the amount of information users recalled from the advertisement, and their attitude toward the advertisement.

### ***Informativeness of the Ad***

Results showed that as the degree of advertisement vividness increased from low to medium, the perceived informativeness of the advertisement decreased. However, a further increase in advertisement vividness from medium to high, increased a user's perceived advertisement informativeness. While both males and females showed a decrease in perceived advertisement informativeness, the results showed that female users were less affected by increased advertisement vividness from low to medium than male users.

Advertisements featuring products with low product involvement showed an increase in a user's perceived informativeness when the advertisement vividness increased from medium to high. On the other hand, advertisements featuring products with a high level of product involvement showed that advertisement informativeness remained relatively the same when advertisement vividness increased from medium to high.

The results showed that users' goals did not contribute toward their perceived informativeness of the advertisement.

### ***Time Spent Viewing Advertisement***

The independent variables were also hypothesised to have an effect on the amount of time users spent viewing an advertisement.

Users generally spent more time viewing the advertisement as the degree of advertisement vividness increased. A comparison of advertisements for products with high and low levels of product involvement showed the same trend, with an increase in the amount of time spent viewing the advertisement as the level of advertisement vividness increased. However, the time spent viewing advertisements for high involvement products was higher than that spent viewing advertisements for low involvement products, across all degrees of advertisement vividness. This difference

can potentially be attributed to the greater amount of information and the greater complexity of the product featured in the advertisements for high involvement products.

The analysis showed that an increase in advertisement vividness from low to medium resulted in an increase in the amount of time users spent viewing advertisements for low involvement products compared to those for high involvement products. However, increasing the advertisement vividness from medium to high lead to an opposite effect, where advertisements for high involvement products instead resulted in a greater increase in the amount of time spent viewing the advertisement compared with advertisements for low involvement products.

An analysis by gender showed that male users generally spent more time viewing advertisements. There was a greater increase in the amount of time users spent viewing advertisements for female users compared to male users, as advertisement vividness increased from low to medium. However, female users were not as affected by increased advertisement vividness from medium to high as their male counterpart, as male users showed a greater increase in the amount of time they spent viewing the advertisements. There are no clear differences between male and female users when viewing advertisements with medium levels of vividness.

Again, the results showed that the user's goal did not exhibit any effect on the amount of time users spent viewing an advertisement.

### ***Information Recall***

Results on the amount of information users were able to recall after viewing an advertisement revealed an interesting trend for advertisements for high involvement products. It was found that as vividness increased, information recall decreased. This can possibly be attributed to the effect of information overload whereby increasing the number of stimuli will reduce the impact from each source (Baron, 1986; March, 1994). However, results showed that this decrease in information recall was only true for users who had been given goals based on their stage in the buyer decision process, and not for those in the control group. The amount of information users recalled did not change



when exposed to different degrees of advertisement vividness when users were not given a goal. No trend was apparent for advertisements for low involvement products.

### ***Brand Recall***

Advertisement vividness was found to affect a user's ability to recall the brand featured in the advertisements. As the vividness in the advertisement increased, the percentage of users correctly recalling the brand featured in the advertisement decreased. A closer analysis of the results showed that the percentage decrease of users correctly recalling the brand for increased advertisement vividness from low to medium and low to high were significant. However, the increase in advertisement vividness from medium to high did not show any significant decrease in brand recall.

For advertisements for high involvement products, increased advertisement vividness resulted in a decrease in the probability of brand recall when advertisement vividness increased from low to high. However, advertisements for low involvement products only showed a significant decrease in brand recall between low and medium advertisement vividness.

### ***Attitude Toward the Ad***

Experimental results showed that increased advertisement vividness from low to medium had no effect on users' attitude towards the ad. A further increase in advertisement vividness from medium to high however, showed positive response in users' attitude towards the ad.

Advertisements for products with high and low product involvement were compared. Results showed that an increase in advertisement vividness from medium to high resulted in a greater increase in attitude towards the ad for advertisements for products with low product involvement compared with advertisements for products with high product involvement.

Both male and female users showed similar attitude towards the ad results when exposed to advertisements with low and high vividness. However, when exposed to a medium level of advertisement vividness, male users expressed a less positive attitude

towards the ad than female users. Male users' attitude towards the ad was more affected by increased advertisement vividness compared with female users. Female users showed a slight increase in attitude towards the ad when advertisement vividness increased from low to medium, while male users showed a decrease in attitude towards the ad. Increasing advertisement vividness from medium to high resulted in a greater increase in attitude towards the ad for male users compared with female users.

User's goal did not contribute to any effect on attitude towards the ad.

#### 7.2.2.2 Effects of Time Spent Viewing Ad

##### ***Information Recall***

Despite literature showing support for a relationship between the amount of time users spent viewing an advertisement and the amount of information users can recall (Danaher & Mullarkey, 2003; Krugman et.al., 1995; Rossiter et. al., 2001; Swallen, 2000), no relationship was found linking the two together in this study.

##### ***Brand Recall***

The literature has suggested that time spent viewing an advertisement has an effect on brand recall (Singh & Rothschild, 1983). Results from this experiment supported this assertion, but only for ads with low and medium levels of vividness. Although a relationship between the two variables was evident, time spent viewing ads were only able to explain 2.7% of the variance in brand recall for high vividness advertisements and 1.9% for low vividness advertisements. It appears the purpose of creating brand awareness was lost for highly vivid advertisements.

#### 7.2.2.3 Effects of Attitude Towards the Ad

##### ***Brand Recall***

This study was unable to determine a relationship between attitude towards the ad and brand recall as proposed in the research hypothesis. In other words, getting a better impression from the advertisement does not naturally mean a person will better remember the brand featured in the advertisement.

### ***Attitude Toward the Brand***

Attitude towards the ad was found to significantly predict attitude toward the *actual* brand (the brand that was in the ad) for highly vivid ads. However, attitude toward the brand only accounted for 1.9% of the variance of the positive relationship outcome. Advertisements with low and medium levels of vividness did not show any relationships between the two variables. On the other hand, attitude towards the ad was found to significantly predict attitude toward the *perceived* brand (the brand participants thought they saw in the ad) for advertisements with a medium level of vividness, accounting for 2% of the variance of the positive relationship outcome.

Despite the considerable literature supporting the relationship between attitude toward the ad and attitude toward the brand, the results from this study did not provide substantial evidence to show this relationship in the context of mobile advertising.

### ***Attitude Toward Receiving Mobile Phone Ads***

Experimental results showed that users' attitude towards the ad affected their attitude towards receiving the type of mobile phone advertisements. They also showed that an increase in advertisement vividness increased the effect of attitude towards the ad on attitude toward receiving the type of mobile phone advertisements. This finding suggests that increasing users' attitude towards the ad by means of using highly vivid advertisements will increase the re-patronage for users receiving these types of advertisements.

#### **7.2.2.4 Effects of Novelty**

Novelty of the advertisement was hypothesised to have an effect on the amount of time users spent viewing the advertisement and users' attitude towards the ad.

Analysis of the results from this study showed that the novelty of the advertisement did not influence the amount of time users spent viewing the advertisement, as proposed by Bezjian-Avery et. al. (1998). In contrast to the results obtained by Edwards and Gangadharbatla (2001) linking novelty of the websites with attitude towards the ad, this current study was unable to produce similar effect on the novelty of mobile phone advertisements. The Habituation-Tedium Theory (Tellis, 1997) may provide an

explanation of these results. In this theory, novel advertisements initially lead to uncertainty and tension before users develop positive attitudes through a process called habituation. This is in line with the way this experiment was conducted in which novelty was defined in the questionnaire as ‘the first exposure to the type of advertisement’. The comments in the experiment (see Chapter Six) also supports this possibility by showing that users go through a learning curve when exposed to novel advertisements presented via mobile phone.

## **7.3 RESEARCH IMPLICATIONS**

### ***7.3.1 Theoretical Implications***

The research reported in this thesis has found numerous results, with some supporting existing traditional advertising theories and others contradicting those theories. With mobile advertising still developing as a new technologically advanced advertising media, it is inevitable that some traditional advertising theories may not hold true when applied to mobile advertising. This section shall look at the theoretical implications of findings from this research by looking at the research variables individually.

#### ***Vividness***

Vividness was shown to exert a strong influence on determining the effectiveness of mobile advertisements. It was shown that vividness affected informativeness of an advertisement, the amount of information users can recall from viewing an advertisement, recall of the brand in an advertisement, the amount of time users spent on viewing an advertisement, and users’ attitude towards the advertisement. Although these effects varied to different degrees, advertisement vividness made an integral contribution to the study of mobile advertising.

#### ***Product involvement***

In a similar way to vividness, product involvement was also identified as an important contributing variable that affected the informativeness of an advertisement, the amount of information users can recall from viewing an advertisement, recall of the brand in an advertisement, the amount of time users spent viewing an advertisement, and users’ attitude towards the advertisement. These results support previous research findings, for

example Drossos and Fouskas (2010), who identified product involvement as an important factor affecting the effectiveness of mobile phone advertisements. Hence it is crucial to include product involvement into future mobile phone advertising studies.

### ***Consumers' Goals***

Although this thesis proposed that consumer goals can be differentiated into multiple groups using the theory of *stage of buyer decision process*, experimental results were unable to provide any evidence to support differences in this multi stage grouping. Interestingly, consumer goals did not show any effect on most of the dependent variables studied, except for the amount of information users can recall from viewing an advertisement. These findings are contradictory to existing theories that suggest goal-oriented and goal-driven behaviour affect the retrieval and use of information, of attitude, and choice behaviour (Bagozzi, 1992; Bettman, 1979; Huffman & Houston, 1993). For information recall, the experimental results only showed a difference between the groups of users who were assigned a goal and those in the control group who were not, when viewing advertisements for high involvement products. This suggests that the role of consumer goals in information recall only requires differentiation in terms of the presence or absence of consumer goals rather than the specific the type of goal involved.

### ***Effects of Time Spent Viewing Ad***

This research attempted to establish an indirect measure of effectiveness of an advertisement through the use of the amount of time users spent viewing the advertisement. The results failed to find any correlation between the amount of time users spent viewing an advertisement with the amount of information users were able recall from the advertisement. However, there were indications that the amount of time users spent viewing the advertisement had an effect on brand recall for advertisements with low and medium levels of vividness.

### ***Effects of Attitude Toward the Ad***

While attitude toward the ad has been linked to consumer brand beliefs, brand attitude, and purchase intentions (Mackenzie et al., 1986; Shimp, 1981), this thesis was unable to conclusively show a relationship between attitude towards the ad and attitude towards

the brand in mobile advertising. The experimental results suggested that attitude towards the ad significantly predicted attitude toward the actual brand for highly vivid advertisements, and attitude toward the perceived brand for advertisements with medium vividness; however, the results only explained a low level of the variance for the attitude towards the brand. The study was also unable to determine any relationship between attitude towards the ad and brand recall. Strong support was found linking attitude towards the ad with a positive attitude toward receiving mobile phone advertisements.

### ***Effects of Novelty***

Despite initial expectations that the novelty of an advertisement may have played a significant role in mobile advertising, it was found that novelty did not affect any of the variables studied. Neither the amount of time users spent viewing an advertisement nor the attitude towards the ad were found to be affected by novelty. If the Habituation-Tedium Theory (Tellis, 1997) can be applied to studies of mobile advertising as suggested earlier, measuring levels of novelty as a scaled variable instead of a dichotomous variable may be necessary to show if there are any effects from the novelty of the advertisement.

### ***7.3.2 Managerial Implications***

From the start, this thesis has set out with two practical objectives. The first was to understand what makes mobile phone advertisements effective. It was hoped that the advertising industry may benefit from using the findings from this thesis where advertising agencies may improve the effectiveness of their proposed mobile campaigns to their clients and also allow advertisers to avoid falling into scam advertising.

This study has found that increasing advertisement vividness increases the users' willingness to receive the type of advertisement and increases their positive attitude towards the ad itself. However, these benefits come at the cost of the advertisement apparently losing its effectiveness in delivering the advertised message. Based on the measurements of effectiveness used in this study, advertising products with low level of involvement resulted in greater effectiveness than advertising products with high involvement levels, for advertisements delivered to mobile phones. In a similar way to

vividness, novelty distracts users from the advertising message; hence novelty may not be advantageous to advertisers. These findings reinforce the concerns expressed by advertisers on the practice of scam, whereby advertising agencies are focused on gaining a good impression from the advertisements instead of focusing on delivering the advertising message for advertisers (refer to interview report in section 3.3.2.3).

A possible advantage of using highly vivid advertisements in mobile advertising may be to use the type of advertisements on proprietary products whereby users may not be required to recall specific information from the advertisement but are able to associate the type of product to the advertisement. Subsequent supplementary advertising campaigns that focus on delivering information can later be incorporated to provide the required specific information to consumers. However, this proposed approach requires further research.

The second objective of this thesis was to identify a potential measure of effectiveness that reflected its value in terms of depth, a concept that is understandable and measureable by the industry. This thesis proposed the use of the amount of time users spent viewing an advertisement as an indirect measure of advertising effectiveness. Unfortunately, although users spent more time viewing advertisements with higher levels of vividness, the increase in time spent viewing the advertisements did not translate into higher levels of information recall. Therefore the amount of time users spent viewing an advertisement does not appear to be useful as an indicative measure of advertising success.

## **7.4 LIMITATIONS**

This research comes with a number of limitations inherent in any experimental study. As a result of the many assumptions made in this study, five major limitations were identified and will be discussed in this section.

The first major limitation is in the student sample. Although it is justifiable to use a student sample as the demographic group represents a major group of mobile phone users, the sample does not represent the complete population of mobile phone users. The regional nature of this study also limits the sample to university students in

Christchurch, New Zealand. Variables such as culture, education, income and age may affect results in a more comprehensive study. Hence, a further large-scale research project that includes different regions will need to be conducted to verify the findings from this study.

Secondly, only two products were used in this study. Each of these product represented products with high product involvement and low product involvement respectively. This single product representation carries the assumption that each of the products represents their respective group; hence any variation due to their possible unique qualities would not have been apparent if they contributed to the results. In order for the results to be verified, this study will need to be replicated on a variation of products to represent a broader range of products with differing levels of product involvement.

The conditioning of users to specific user goals makes up the third limitation in this study. Although conditioning users may have been an acceptable approach, a sample with pre-existing goals would have been ideal. As consumer goals are usually developed through an on-going process, it is possible that conditioning users to specific goals immediately before participating in the experiment led to the limited results found in this study.

The fourth major limitation is in the advertisements that represented the three different degrees of vividness. Although the ranking of the advertisements in terms of their degree of vividness was clear, this study assumed evenly distributed intervals between these degrees of vividness. Such an assumption may lead to experimental artefacts in the representation of vividness.

Finally, the maturation effect was not studied. Due to practical limitations of this experiment, users were only given one chance to view the advertisements and were not given the opportunity to get accustomed to the advertisements by revisiting them. As explained by Tellis (1997) through Figure 2.d in Chapter Two, repetition of advertisement has an inverted 'U' effect on response to advertisement through the process of habituation and tedium. The single view of each advertisement meant that participants may not have gotten the opportunity to develop response to the ad. Hence,



maturation effect may reveal the novelty effect that was not immediately apparent in this study.

## **7.5 FUTURE RESEARCH DIRECTIONS**

The limitations identified in the previous section suggest some directions for future research. These include using samples of users from different regions, expanding the research to different products, using existing consumer goals instead of conditioning goals artificially, and conducting longitudinal studies to identify the novelty effect. Building upon the results from this thesis and the focus group report in Chapter Two, five additional future research directions were identified.

Although mobile phones and smartphones are a common tool for users in this current generation, these devices are an example of cutting edge technology that continues to develop. Advertisers in this area continue to challenge mobile technology by delivering increasingly higher vividness in providing advertising content. The technology that is being used to generate these highly vivid advertisements may initially entice users who are more technologically sophisticated than others, therefore making the effects of vividness on technologically savvy users and their non-technologically savvy counterpart an interesting topic that can be built on this thesis.

Other than advertising, mobile phones can also be used to receive promotions and purchase items through mobile commerce. An interesting area of research will be to identify whether the positive attributes found in this study can similarly be applied to improve mobile promotions and mobile commerce.

As mobile phones are portable devices, users possess the freedom to view advertisements whenever and wherever they please. This freedom creates situations where users may view advertisements in an indoor or outdoor environment, privately, with peers, or in a crowd. Such environmental and peer interaction effects may contribute to the effectiveness of mobile phone advertisements.

Using time spent viewing an advertisement as an indirect measure for effectiveness of an advertisement was unsuccessful in this study. As there are still interest from

advertisers to measure depth of their mobile advertising campaigns, ways to gauge this effectiveness indirectly should continue to be evaluated.

Finally, although mobile advertising has the potential to reach a vast number of users on their personal mobile devices as opposed to traditional media, this study is ultimately a comparison of different degrees of vividness in mobile phone advertising. It does not however identify the differences in effectiveness between traditional media and mobile media. Further research should look into comparing the effectiveness between advertising in traditional media and mobile media to understand if mobile advertising is providing value to advertisers and consumers alike.

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## **APPENDICES**

### **APPENDIX ONE**

Table A.3a: Focus Group Summary

| 1   | IMPRESSION  |  |
|-----|---|--|
| 1.0 | <i>What is your impression of this technology?</i>  | <ul style="list-style-type: none"> <li>- Exciting</li> <li>- Innovative</li> <li>- A lot of potential.</li> <li>- Can see good for company like Nike as a viral campaign.</li> <li>- There are some obvious limitations.</li> <li>- It is software.</li> <li>- Small target group.</li> <li>- Early tech adaptors who are tech minded.</li> </ul> <p>Good for companies that has that kind of target in mind.</p>  |
| 1.1 | <i>What is your first impression?</i>   | <ul style="list-style-type: none"> <li>- Take notice because it is different.</li> <li>- It requires users to actively seek out the ad.</li> <li>- Needs to be easy to use, easy to download.</li> <li>- Will work well if we can SMS to a number and the application automatically downloads and install.</li> <li>- Even though the technology is very interesting, the content still matters. Require to put effort into creating content and not 'wow' people with the technology alone.</li> </ul>  |
| 1.2 | <i>If someone were to use the mobile phone in public viewing the AR content on their phones will you be attracted to it or ignore it?</i> | <ul style="list-style-type: none"> <li>- I'd be interested in it, but that is because I am interested in that sort of thing, technology.</li> <li>- I'd be curious and intrigued, and wondering what they are doing.</li> <li>- Has to be the right target market.</li> </ul>  |
| 2   | RELATION  |  |
| 2.1 | <i>Have you seen something similar to this before or something that gives you the same impression?</i>                                    | <ul style="list-style-type: none"> <li>- No, nothing like that (consensus).</li> </ul>   |
| 2.2 | <i>Not referring to the technology but something that gives you the same type of impression?</i>  | <ul style="list-style-type: none"> <li>- Scratchy card with code</li> <li>- Scratchy card on AR tech would definitely be good</li> <li>- Camera viral campaign, where actors pose as Japanese tourist, asking people to help them take photos with their camera and telling them how cool the cameras are.</li> <li>- Reminds me of 3D Games</li> <li>- Static images would not give a feel. The ad needs to be animated. But the game was fun because there are codes that people have to go around to find them.</li> <li>- Ad offering good prices will be good as</li> </ul> |

|          |   |  |
|----------|---|--|
|          |   | well.  |
| <b>3</b> | <b>APPLICATION</b>  |  |
| 3.1      | <i>How do you see this technology being applied in marketing?</i>   | <ul style="list-style-type: none"> <li>- By having non-static markers pop up in places like internet, TV and on screen, and markers that people can print out.</li> </ul>  |
| 3.2      | <i>We are currently limiting our applications based on the use of markers. What other ways of applying this technology in marketing can you think of without being limited to the use of markers?</i>       | <ul style="list-style-type: none"> <li>- A big plate of food or pie in front of a restaurant.</li> <li>- Some airlines now allow us to use cell phones on planes. People sit on a plane for more than 12 hours at a time. Have something like that on magazines can be used as entertainment.</li> <li>- The ad needs to be fully animated to be properly exciting.</li> <li>- Personalised messages on the application where a video pops up on my mobile phone saying "hi Richard" will be good.</li> <li>- This personalisation will have to be permission based where users sign up for it.</li> </ul> |
| <b>4</b> | <b>PROBLEMS</b>   |  |
| 4.1      | <i>What do you not like about the technology and the potential problems with this technology?</i>   | <ul style="list-style-type: none"> <li>- The size of the screen makes game play difficult on the mobile phone.</li> <li>- Users need to have steady hands to play the game</li> <li>- There is a time delay where the application loses track of the marker and the image flips upside down. This takes a bit of time to reconfigure itself.</li> <li>- These are technological problems.</li> </ul>   |
| 4.2      | <i>What do you foresee the effect of this problem might be?</i>   | <ul style="list-style-type: none"> <li>- People will lose interest in it pretty quickly. If it is hard to use, nothing will happen, full stop. If it takes a minute or more to get the game playing, people will just play their normal games without 3D.</li> <li>- There is also the logistic problem, if the application is only developed for say Nokia; I presume different mobile phones will need different software. People will feel left out if they cannot get their phone to use it.</li> </ul>  |
| <b>5</b> | <b>IMPLICATIONS</b>   |  |
| 5.1      | <i>What do you think the negative effect of using this technology might have in marketing? Let say if some mobile phones do not work with the software. What are the implications of this in marketing?</i> | <ul style="list-style-type: none"> <li>- Perhaps this will limit the target market that is only involve/interested in technology.</li> <li>- If someone had a phone but the application does not work on the phone because the phone is not compatible with the software, the person would definitely get upset.</li> <li>- Worst case scenario is when a person</li> </ul>  |

|          |  |   |
|----------|--|---|
|          |  | downloads the application but it does not work on their phone.  |
| 5.2      | <i>If there is a similar campaign with different 3D graphics, what would your impression of it be?</i>   | <ul style="list-style-type: none"> <li>- Definitely less interested the second time round.</li> <li>- This application is a lot harder for people to gain the message compared to just a billboard.</li> <li>- The first time that you see it is the most important. If it has the same concept but slightly different, the wow factor will be gone.</li> </ul>   |
| 5.3      | <i>What is required to be in there to still grab the attention?</i>  | <ul style="list-style-type: none"> <li>- It needs to have incentives or entertainment value. It has to keep people engaged the whole time eg. developing storyline.</li> </ul>  |
| 5.4      | <i>What if we run the same campaign twice?</i>   | <ul style="list-style-type: none"> <li>- First time would be great but this will wear thin pretty quickly. It is more convenient to look at a poster than to pull your phone out and wait to see what is in the code.</li> <li>- When you know what to expect, there will not be any excitement the second time around.</li> </ul>  |
| <b>6</b> | <b>SOLUTIONS</b>   |   |
| 6.1      | <i>What improvements can be made to this technology to make it a better marketing tool? How do you solve these problems in the technology?</i> | <ul style="list-style-type: none"> <li>- Make sure that the application is compatible by getting rid of any bugs. All down to the design of the software.</li> </ul> 7.5.1  |
| 6.2      | <i>Quality of graphics or user quantities?</i>   | <ul style="list-style-type: none"> <li>- It is important to deploy software that covers more mobile users and at the same time, getting it to work properly. Even if it means less amazing or fantastic, it would be better to have it work on more platforms. This can be done by perhaps making it 2D, reduce by scaling down or something. I would rather be excluded than having a problem with it. Having the application downloaded and finding out that it does not work will really piss me off.</li> <li>- Usability is important. The easier it is to use, the less frustrated people will be when using it.</li> </ul> |
| 6.3      | <i>Can you elaborate what you mean by usability?</i>   | <ul style="list-style-type: none"> <li>- Download flawlessly, install flawlessly, runs flawlessly so that the average person can come up and use it. For example, a digital camera. It has an interface that is easy to use. You just have to point and shoot. Same sort of thing applies to this technology.</li> </ul>  |

| 7   | IN FOCUS GROUP COMMENTS AND DISCUSSIONS  |  |
|-----|--|--|
| 7.1 | <p><i>Is there anything else you would like to add to this topic that I might have potentially missed?</i></p> | <ul style="list-style-type: none"> <li>- Use of the technology like the one with the football boots (AR Nike) gives people a taste of the technology and leaves people anticipating for what is to come.</li> <li>- The use of this technology involves a lot of effort to use.</li> <li>- It is an involvement campaign.</li> <li>- Requires different things to happening all the time by perhaps, having developing story line in order to keep people interested. Something has to happen in the end that makes people wonder what else is going to happen.</li> <li>- It needs to let people keep on guessing what to will happen next.</li> <li>- Has to be something immediate, doable in a short amount time. People will not participate in it if it takes hours to carry out.</li> <li>- Will be good to carry out this campaign in a mall or perhaps in a train.</li> <li>- Quote: "If there is a crowd doing it, then I will do it as well"</li> <li>- Will not go around the city alone looking for the markers.</li> </ul> |

Table A.3b: Interview Summary

|          |   |  |
|----------|---|--|
| <b>1</b> | <b>Advertising Structures</b>             | <ul style="list-style-type: none"> <li>- There is a structure in the advertising industry.</li> <li>- Brand appoints agency of record that works with network agencies to produce different elements of their advertising strategies.</li> <li>- Different agencies in charge of different media, eg. print, television, radio, digital and outdoor.</li> <li>- Mobile advertising does not fit anywhere in the structure</li> <li>- There are agencies that describe themselves as 360 agencies that cover all different aspect of advertising and have the right to engage brands.</li> <li>- Industry is all about network connections. Because they are often performance paid and would like to produce matrix to show their success.</li> <li>- Need to understand the structures because at the end of the day, somebody is making the buying decision in each of these levels to create consumer experience.</li> <li>- Economic downturn means there are now more agencies thrown into more 360 style agencies.</li> <li>- These new 360 agencies now have the right to engage the brands.</li> </ul> |
| <b>2</b> | <b>Practice of scam in Advertising</b>    | <ul style="list-style-type: none"> <li>- SCAM is fairly widespread.</li> <li>- SCAM is an issue in the advertising industry where agencies produce an ad not for the client's benefit but for their own with the focus on getting awards.</li> <li>- Many different awards to motivate them to SCAM.</li> <li>- New technologies are often used as a basis for SCAM.</li> </ul>  |
| <b>3</b> | <b>Reward</b>                             | <ul style="list-style-type: none"> <li>- Get paid on percentage media spent.</li> <li>- Media buying agencies might get 15% of whatever media that is bought</li> <li>- Creative agencies might get 10% of the total advertising budget for producing work.</li> <li>- This is fairly the traditional structure that is used in a lot of different areas of work.</li> <li>- It is not so clear with mobile. Mobile does not follow the 90% spent on media and 10% on production structure. A lot of advertisers struggle with the idea of building brands and applications.</li> <li>- Interactive agencies usually work on websites. Gets rewarded based on CPI and CPC.</li> <li>- Viral on YouTube is great because it tells you there are x number of users who viewed the ad but does not necessarily mean they are the actual target market or if they are just viewing.</li> </ul>   |
| <b>4</b> | <b>Change in the Advertising Industry</b> | <ul style="list-style-type: none"> <li>- Interactive is still new in the advertising industry and is more online based and not mobile based.</li> <li>- Mobile is sitting outside. Mobile marketing tends to be regarded as service providers. In order to win business, they will have to work with creative agencies or possibly 360 agencies.</li> </ul>  |

|   |                                 |  |
|---|---------------------------------|--|
|   |                                 | <ul style="list-style-type: none"> <li>- Mobile content provider works with media companies, creative agencies and network agencies, all these different levels, but not service distribution. That will have to go to service provider.</li> <li>- Mobile technology and creative provider has to find an agency that is motivated to deliver the mobile ad.</li> <li>- Check if motivated agency also has print campaign. If not, then will have to find other agency that will be interested in it since there is money to be made.</li> <li>- Position in there in order not to be threatening and the only way to attract budget. There isn't a specific channel to go to.</li> <li>- The structure is being challenged. Mobile content provider will have more direct relationship and the brand will start telling agencies how to support them.</li> <li>- Brands now understand the implications of these structures and ultimately want to reach consumers with their message. They no longer want their work to be structured into suit the advertising agency structure.</li> <li>- People are now far more focused in cross media strategies and wanting the same message across all media, not individual agencies trying to pitch their own message.</li> </ul> |
| 5 | <b>Decision Making</b>          | <ul style="list-style-type: none"> <li>- Decision making process is influenced by industry structures that determine ultimately what the consumers will see in the main advertising.</li> <li>- Billboard or the outdoor companies have very personal structure and run outside the digital expertise, hence the two don't talk.</li> <li>- Mobile technology typically deployed through digital port but there is interest in using cross media advertising. This creates a bit of an issue as the outdoor agencies have the budget and rights to carry out.</li> </ul>   |
| 6 | <b>Need</b>                     | <ul style="list-style-type: none"> <li>- Need to be able to categorically demonstrate that the mobile technology advertisements are able to increase the client's profitability and have some form of retain branded value potential.</li> <li>- Strategy people inside the brand only concern about sales. Claiming large viewing audience result in increase of sales is a huge leap in terms of cause and effect.</li> <li>- There is a lot of talk about reach and depth. Reach is the number of people who get to view the ad and depth is the retention from the ad viewing experience.</li> <li>- Mistake in mobile marketing using reach as a measure of success as reach is a traditional marketing measurement. Instead should use depth where you reach smaller number of people but have them remembering the message, having fun and passing it on.</li> <li>- Depth is very hard to measure/determine.</li> </ul>  |
| 7 | <b>Interest in the Industry</b> | <ul style="list-style-type: none"> <li>- Want to understand the elements in user experience that increase message retention (eg. audio feedback, 2D</li> </ul>   |

|  |  |   |
|--|--|---|
|  |  | <p>vs 3D, expected vs delivered, real time experience, frame rates etc.)</p> <ul style="list-style-type: none"> <li>- Experience with the mobile advertisement with experience of other advertisements.</li> <li>- Consistency with the perceived understanding of the brand. Relationship with other brand message within the brand.</li> <li>- Is it more beneficial to shift peoples' perception of a brand or is it more important to reinforce the brand message.</li> <li>- Which demographic does it attract and most effective on. Need to be very careful with claims of demographic that the mobile advertisement is targeting.</li> <li>- The creative elements and the consumer behaviour elements are most important.</li> <li>- The human elements are important to identify their needs in terms of experience from both consumer and brand perspective.</li> <li>- Want to understand the characteristics that make the technology effective in advertising than the technology itself as technology will advance.</li> </ul> |
|--|--|---|



## **APPENDIX TWO**

Table A.5a: Comments, observations and changes made to experimental questionnaires.

|    | Comments/Observation/Changes Made  |
|----|--|
| 1  | <p>Came up with a few spelling errors</p> <p>Clarification on some instructions e.g. clearly specify that they are 3 different ads, clearly indicate which ads the questions refer to.</p> <p>Participant commented that the colour red was associated to Toyota therefore; the red colour was removed from the information sheets and replaced with a neutral colour, white.</p> <p>Insertion of the option, “don’t know” for brand recall questions.</p> <p>Renaming of the video files that will be used to a generic name instead of the brand name.</p> |
| 2  | <p>Questions on how to get hold of the application drove to the question, will people want to download the application to use it?</p> <p>Two questions were added after each of the self contained questions on each mobile phone ads.</p> <ul style="list-style-type: none"> <li>- Familiarity with the type of ad</li> <li>- Interest in receiving the type of ad in the future</li> </ul>   |
| 3  | Found error in script. Fixed   |
| 4  | Observation: Role playing section was ignored by participant despite clearly stating that it is an important part of the experiment.   |
| 5  | <p>Saw the role playing section but couldn’t relate to the experiment/survey questionnaires.</p> <p>Role playing section was reiterated on each part of the questions.</p>   |
| 6  | Need to make clearer which ad is which. Procedure changed to mention the ad viewed after each ad.  |
| 7  | User tilt camera phone to have a better view of the text and image on the AR ad.   |
| 8  | <p>Question 7, put maybe. Add advertising and marketing into question 3</p> <p>Change user ID to username</p>  |
| 9  | <p>Q3. Are students in studying marketing and advertising considered professionals?</p> <p>Changed things seen in the ad to include yes/no/not sure instead of just yes/no</p>   |
| 10 | The ad made user dizzy   |
| 11 | None   |
| 12 | Noticed that participant rate attitude towards the brand higher for ads assumed to be featured (in this case, a dummy brand).  |
| 13 | <p>Logo appeared twice (corrected)</p> <p>Make it easier to link the type of ads to the ads. (improvement to experiment was made by making cue cards that will be presented after each ad is viewed.</p>   |

## **APPENDIX THREE**

**High Involvement Product**  
eg. Product A (CAR)

# WELCOME



Thank you for your interest towards participating in this mobile advertising activity.

## Structure

This experimental study consists of 3 main components – 5 questionnaire sections and the viewing of 3 *DIFFERENT* mobile phone ads. You will be asked *immerse yourself in a scenario* prior to viewing the mobile phone ads.

## Confidentiality

The study including your questionnaire is anonymous. The data will be available only to the research team involved in this study and all information gathered will be kept in a secure database.

The results of the project may be published, but you may be assured of the complete confidentiality of individual data gathered in this study.

We will however, record your staff/student ID separately to ensure no participant repeats the study and to verify that you have received the incentive for participating.

## Purpose

This experimental study forms part of a PhD research project being conducted through the University of Canterbury by Allen Lim under the supervision of A/Prof.

Kevin Voges, who can be contacted at +64 3 364 2987 ext 8626 or +64 3 364 2987 ext 7239. They will be pleased to discuss any concerns you may have about participation in the project.

The project has been reviewed and approved by the University of Canterbury Human Ethics Committee.

Your study code is:

**0158**

Start

Figure A.5.1a: (Web Page One) Introduction to experiment page.

## Section A



Q5. How do you overall rate the mobile phone Nokia N95 (as shown in picture above)?

|              | Like                  | Neutral               |                       |                       |                       |                       | Dislike          |
|--------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------|
| Good         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Bad              |
| High quality | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Low quality      |
| Worth owning | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not worth owning |
| Impressive   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not impressive   |
| Advanced     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not advanced     |
| Dependable   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not dependable   |


Q6. Please rate your view on receiving advertisements on your mobile phone?


|                | Like                  | Neutral               |                       |                       |                       |                       | Dislike           |
|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------|
| Irritating     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not irritating    |
| Favourable     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not favourable    |
| Pleasant       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Unpleasant        |
| Likeable       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Unlikeable        |
| Positive       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Negative          |
| Overall liking | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Overall disliking |


Q7. Do you have any intention to purchase a CAR within the next year ?


- ☐ Yes  
☐ No


Q8. Indicate your opinion of the following CAR brands:


 0  
 Dislike the brand for this product      Neither like nor dislike      Like the brand for this product  
**HONDA**


 0  
 Dislike the brand for this product      Neither like nor dislike      Like the brand for this product  
**TOYOTA**


 0  
 Dislike the brand for this product      Neither like nor dislike      Like the brand for this product  
**MAZDA**


 0  
 Dislike the brand for this product      Neither like nor dislike      Like the brand for this product  
**NISSAN**



 0  
 Dislike the brand for this product      Neither like nor dislike      Like the brand for this product  
**MITSUBISHI MOTORS**

Q9. Which brand do you prefer?

☐  **HONDA**
☐  **MITSUBISHI MOTORS**

Start Experiment

Figure A.5.1b: (Web Page Two) Initial questionnaire.




**\*\*\* IMPORTANT \*\*\***

**Please read carefully and immerse yourself in the following role playing scenario throughout the questionnaires.**

**Role Playing Scenario**

Your car has just broken down and you recognise the need for a new car. You already know the requirements that you would like to have on a car. You prefer the car maker brand **Honda**



**HONDA**

after considering alternative brands.

**INSTRUCTIONS**

1. You will be assigned a mobile phone containing a series of 3 DIFFERENT Ads.
2. You will then be asked to complete a 2 question questionnaire following each task.
3. Please click on "*next*" when you have been assigned a mobile phone and when you are ready to proceed.

Figure A.5.1c: (Web Page Three) Conditioning scenario and initiate time capture for first ad.

**INSTRUCTIONS**

Please click "*continue*" once you have completed the task on the mobile phone.

Figure A.5.1d: (Web Page Four) End ad viewing time capture for first ad.

## Section B.1

### Scenario Reminder

Your car has just broken down and you recognise the need for a new car. You already know the requirements that you would like to have on a car. You prefer the car maker brand after considering alternative brands.

**Q10a. Please select any of the following that best describe your current position at the moment.**

I feel the need for a **CAR** .

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

I would like to seek more information for a **CAR** .

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

I am currently considering alternative brands for a **CAR** .

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

I intend to purchase a **CAR** ?

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

**Q10aa. What did you see on the ad?**

|                                | Yes                   | No                    | Not Sure                         |
|--------------------------------|-----------------------|-----------------------|----------------------------------|
| Dual Airbags                   | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Single Airbag                  | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Alloy Wheels                   | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| ABS Breaks                     | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Heated Electric Leather Seats  | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Traction Control               | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Fuel Injection                 | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Security System                | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 5 Speed Tiptronic Transmission | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 6 Speed Tiptronic Transmission | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Rear Wiper                     | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Bose 6 Speaker Stereo          | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Altec Lansing 6 Speaker Stereo | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Air Condition                  | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Central Locking                | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |

Continue

Figure A.5.1e: (Web Page Five) Intermediate questionnaire for first ad.

## INSTRUCTIONS

1. Please click on "*next*" when you have been assigned a mobile phone and when you are ready to proceed.

Continue

Figure A.5.1f: (Web Page Six) Initiate time capture for second ad.

## INSTRUCTIONS

Please click "*continue*" once you have completed the task on the mobile phone.

Continue

Figure A.5.1g: (Web Page Seven) End ad viewing time capture for second ad.



## Section B.2

### Scenario Reminder

Your car has just broken down and you recognise the need for a new car. You already know the requirements that you would like to have on a car. You prefer the car maker brand after considering alternative brands.

**Q10b. Please select any of the following that best describe your current position at the moment.**

I feel the need for a **CAR** .

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

I would like to seek more information for a **CAR** .

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

I am currently considering alternative brands for a **CAR** .

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

I intend to purchase a **CAR** ?

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

**Q10bb. What did you see on the ad?**

|                                | Yes                   | No                    | Not Sure                         |
|--------------------------------|-----------------------|-----------------------|----------------------------------|
| Dual Airbags                   | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Single Airbag                  | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Alloy Wheels                   | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| ABS Breaks                     | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Heated Electric Leather Seats  | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Traction Control               | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Fuel Injection                 | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Security System                | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 5 Speed Tiptronic Transmission | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 6 Speed Tiptronic Transmission | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Rear Wiper                     | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Bose 6 Speaker Stereo          | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Altec Lansing 6 Speaker Stereo | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Air Condition                  | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Central Locking                | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |

Continue

Figure A.5.1h: (Web Page Eight) Intermediate questionnaire for second ad.

## INSTRUCTIONS

1. Please click on "next" when you have been assigned a mobile phone and when you are ready to proceed.

Continue

Figure A.5.1i: (Web Page Nine) Initiate time capture for third ad.

## INSTRUCTIONS

Please click "continue" once you have completed the task on the mobile phone.

Continue

Figure A.5.1j: (Web Page Ten) End ad viewing time capture for third ad.

## Section B.3

### Scenario Reminder

Your car has just broken down and you recognise the need for a new car. You already know the requirements that you would like to have on a car. You prefer the car maker brand after considering alternative brands.

**Q10c. Please select any of the following that best describe your current position at the moment.**

I feel the need for a **CAR** .

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

I would like to seek more information for a **CAR** .

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

I am currently considering alternative brands for a **CAR** .

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

I intend to purchase a **CAR** ?

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

**Q10cc. What did you see on the ad?**

|                                | Yes                   | No                    | Not Sure                         |
|--------------------------------|-----------------------|-----------------------|----------------------------------|
| Dual Airbags                   | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Single Airbag                  | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Alloy Wheels                   | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| ABS Breaks                     | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Heated Electric Leather Seats  | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Traction Control               | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Fuel Injection                 | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Security System                | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 5 Speed Tiptronic Transmission | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 6 Speed Tiptronic Transmission | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Rear Wiper                     | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Bose 6 Speaker Stereo          | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Altec Lansing 6 Speaker Stereo | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Air Condition                  | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Central Locking                | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |

Continue

Figure A.5.1k: (Web Page Eleven) Intermediate questionnaire for third ad.

## Section C

**Q11.** You will be asked a series of questions regarding the 3 different types of ads (Image Ad, Video Ad and Interactive Ad) that you have just viewed.

**Q11.a.** The following questions will be on the **IMAGE AD**

**Q11.a.1.** What brand was on the **Image Ad**?



**Q11.a.2.** Please indicate on the scale on how much you agree or disagree to the following statements about the **Image Ad**.

|                              | Completely Agree      |                       |                       | Neutral               |                       |                       | Completely Disagree   |
|------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I dislike the ad.            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The ad is appealing to me.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The ad is attractive to me.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The ad is interesting to me. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I think the ad is bad.       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**Q11.a.3.** Please indicate on the scale on how much you agree or disagree to the following statements about the **Image Ad**.

|  | Completely Agree      |                       |                       | Neutral               |                       |                       | Completely Disagree   |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The ad was informative.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The information in the ad was easy to understand.                                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The information in the ad was relevant.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The information that was provided in the ad would help me in making a choice of a CAR. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**Q11.a.4.** Were you familiar with mobile phone **Image Ad** prior to today?

- ☐ Yes  
☐ No

**Q11.a.5.** Assuming you have a mobile phone, please rate your interest in receiving **Image Ads** on your mobile phone in the future?

|                | Like                  |                       |                       | Neutral               |                       |                       | Dislike           |
|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------|
| Irritating     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not irritating    |
| Favourable     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not favourable    |
| Pleasant       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Unpleasant        |
| Likeable       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Unlikeable        |
| Positive       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Negative          |
| Overall liking | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Overall disliking |

Figure A.5.11: (Web Page Twelve) Final questionnaire.  
Continue next three pages...

*Continue...*

**Q11.b. The following questions will be on the VIDEO AD**

**Q11.b.1. What brand was on the Video Ad?**



**Q11.b.2. Please indicate on the scale on how much you agree or disagree to the following statements about the Video Ad.**

[illegible]

**Q11.b.3. Please indicate on the scale on how much you agree or disagree to the following statements about the Video Ad.**

[illegible]

**Q11.b.4. Were you familiar with mobile phone **Video Ad** prior to today?**

- ☐ Yes
- ☐ No

**Q11.b.5. Assuming you have a mobile phone, please rate your interest in receiving **Video Ads** on your mobile phone in the future?**

[illegible]

Continue...

**Q11.c. The following questions will be on the *INTERACTIVE AD***

**Q11.c.1 What brand was on the *Interactive Ad*?**



**Q11.c.2. Please indicate on the scale on how much you agree or disagree to the following statements about the *Interactive Ad*.**

|                              | Completely Agree      |                       |                       |                       | Neutral               |                       |                       |                       | Completely Disagree   |
|------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I dislike the ad.            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The ad is appealing to me.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The ad is attractive to me.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The ad is interesting to me. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I think the ad is bad.       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**Q11.c.3. Please indicate on the scale on how much you agree or disagree to the following statements about the *Interactive Ad*.**

|   | Completely Agree      |                       |                       |                       | Neutral               |                       |                       |                       | Completely Disagree   |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The ad was informative.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The information in the ad was easy to understand.                                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The information in the ad was relevant.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The information that was provided in the ad would help me in making a choice of a CAR . | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**Q11.c.4. Were you familiar with mobile phone *Interactive Ads* prior to today?**

- ☐ Yes  
☐ No

**Q11.c.5. Assuming you have a mobile phone, please rate your interest in receiving *Interactive Ads* on your mobile phone in the future?**

|                | Like                  |                       |                       |                       | Neutral               |                       |                       |                       | Dislike           |
|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------|
| Irritating     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not irritating    |
| Favourable     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not favourable    |
| Pleasant       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Unpleasant        |
| Likeable       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Unlikeable        |
| Positive       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Negative          |
| Overall liking | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Overall disliking |



**Q12. How do you rate the mobile phone Nokia N95 (as shown in picture above)?**

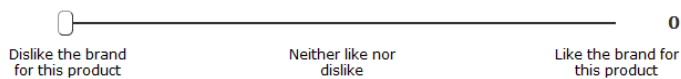
|              | Like                  |                       |                       |                       | Neutral               |                       |                       |                       | Dislike          |
|--------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------|
| Good         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Bad              |
| High quality | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Low quality      |
| Worth owning | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not worth owning |
| Impressive   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not impressive   |
| Advanced     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not advanced     |
| Dependable   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not dependable   |

Continue...

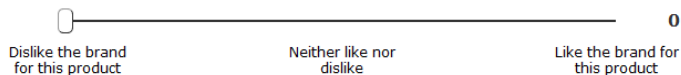
Q13. Indicate your opinion of the following brands:



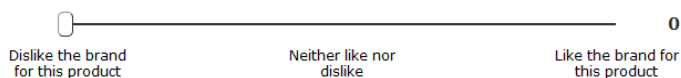
**HONDA**



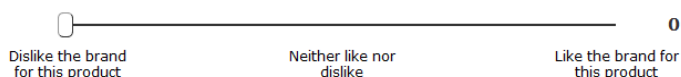
**TOYOTA**



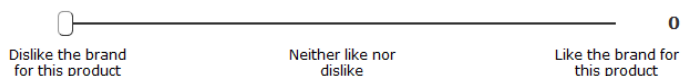
**MAZDA**



**NISSAN**



**MITSUBISHI  
MOTORS**



Q14. Comments

(Please put in any comments that you would like to add)

\* Non-compulsory field

1. Please enter your age.

2. Please specify your gender.

- ☐ Male
- ☐ Female

3. Are you or anyone in your family involved professionally in any of the following?

- ☐ Market research
- ☐ Advertising
- ☐ None of the above

4. Do you own a CAR?

- ☐ Yes
- ☐ No



### Mobile Advertising

#### **Declaration of Consent to Participate**

I have read and understood the information provided about this research project.

I understand that my participation is voluntary and that I may withdraw at any time prior to publication of the findings.

I understand that any information or opinions I provide will be kept anonymous and confidential to the researcher and that any published or reported results will not identify me.

I understand that all data from this research will be stored securely at the University of Canterbury for five years following the study.

I have collected the incentive provided for completing this study.

Student username:  eg. ail13

☐ Please tick this box if you agree to participate in this research project

***Thank you for your contribution to this study.***

[Next](#)

Figure A.5.1m: (Web Page Thirteen) Declaration of consent to participate form.

**\* \* \* COMPLETE \* \* \***



Thank you for your participation.  
Please remember to collect your incentive for participating upon signing the consent form.

Figure A.5.1n: (Web Page Fourteen) Thank you for participating page.

**Low Involvement Product**  
eg. Product D (BEER)



# WELCOME



Thank you for your interest towards participating in this mobile advertising activity.

## Structure

This experimental study consists of 3 main components – 5 questionnaire sections and the viewing of 3 *DIFFERENT* mobile phone ads. You will be asked *immerse yourself in a scenario* prior to viewing the mobile phone ads.

## Confidentiality

The study including your questionnaire is anonymous. The data will be available only to the research team involved in this study and all information gathered will be kept in a secure database.

The results of the project may be published, but you may be assured of the complete confidentiality of individual data gathered in this study.

We will however, record your staff/student ID separately to ensure no participant repeats the study and to verify that you have received the incentive for participating.

## Purpose

This experimental study forms part of a PhD research project being conducted through the University of Canterbury by Allen Lim under the supervision of A/Prof. Kevin Voges, who can be contacted at +64 3 364 2987 ext 8626 or +64 3 364 2987 ext 7239. They will be pleased to discuss any concerns you may have about participation in the project.

The project has been reviewed and approved by the University of Canterbury Human Ethics Committee.

Your study code is:

0194

Start

Figure A.5. 2a: (Web Page One) Introduction to experiment page.

## Section A



Q5. How do you overall rate the mobile phone Nokia N95 (as shown in picture above)?

|              | Like                  | Neutral               |                       |                       |                       |                       | Dislike          |
|--------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------|
| Good         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Bad              |
| High quality | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Low quality      |
| Worth owning | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not worth owning |
| Impressive   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not impressive   |
| Advanced     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not advanced     |
| Dependable   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not dependable   |


Q6. Please rate your view on receiving advertisements on your mobile phone?

|                | Like                  | Neutral               |                       |                       |                       |                       | Dislike           |
|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------|
| Irritating     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not irritating    |
| Favourable     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not favourable    |
| Pleasant       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Unpleasant        |
| Likeable       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Unlikeable        |
| Positive       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Negative          |
| Overall liking | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Overall disliking |


Q7. Do you have any intention to purchase BEER in the next few days ?

- ☐ Yes  
☐ No


Q8. Indicate your opinion of the following BEER brands:




 0  
 Dislike the brand for this product      Neither like nor dislike      Like the brand for this product




 0  
 Dislike the brand for this product      Neither like nor dislike      Like the brand for this product



 0  
 Dislike the brand for this product      Neither like nor dislike      Like the brand for this product



 0  
 Dislike the brand for this product      Neither like nor dislike      Like the brand for this product



 0  
 Dislike the brand for this product      Neither like nor dislike      Like the brand for this product

Q9. Which brand do you prefer?

☐  **export gold**
☐  **Steinlager**

[Start Experiment](#)

Figure A.5. 2b: (Web Page Two) Initial questionnaire.

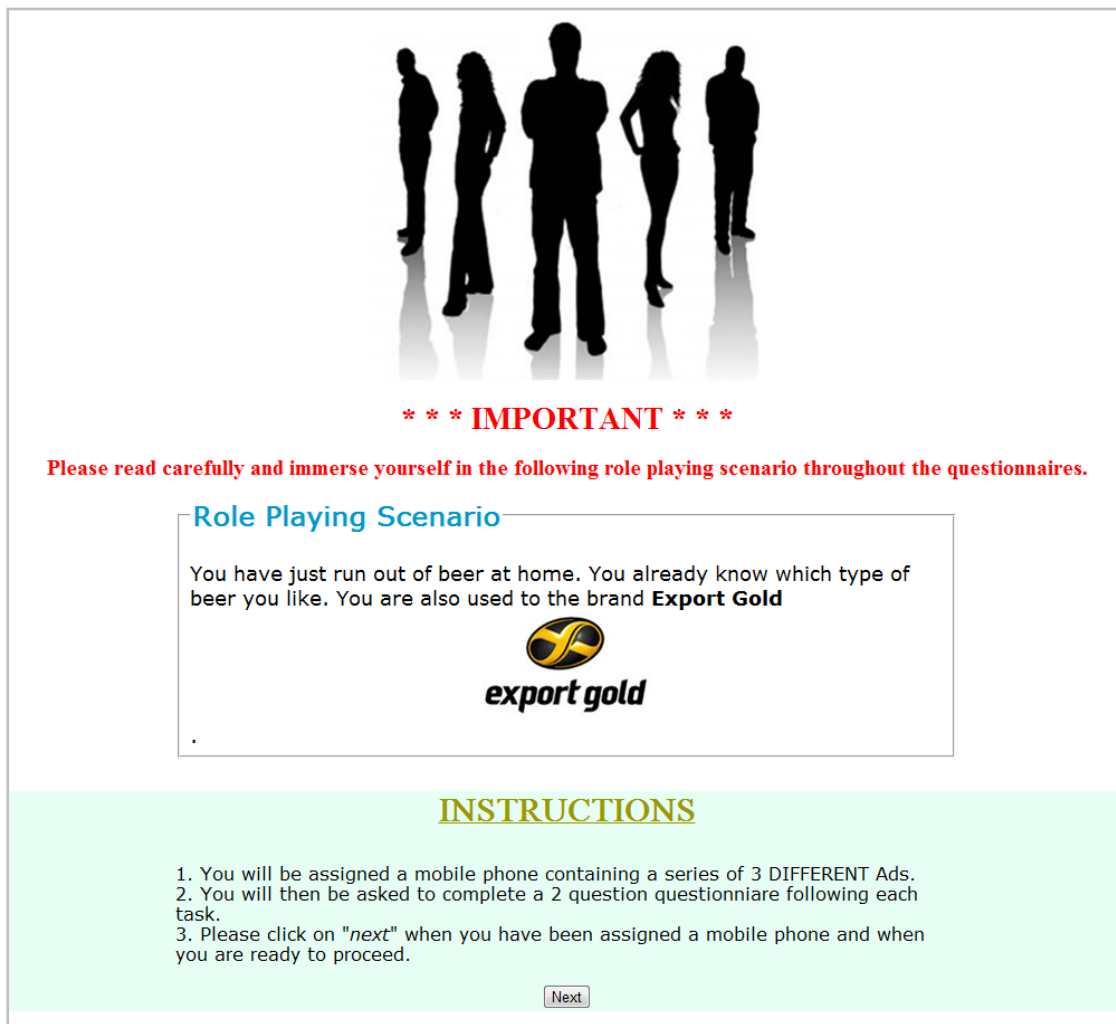


Figure A.5. 2c: (Web Page Three) Conditioning scenario and initiate time capture for first ad.



Figure A.5. 2d: (Web Page Four) End ad viewing time capture for first ad.

## Section B.1

### Scenario Reminder

You have just run out of beer at home. You already know which type of beer you like. You are also used to the brand .

**Q10a. Please select any of the following that best describe your current position at the moment.**

I feel the need for **BEER** .

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

I would like to seek more information for **BEER** .

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

I am currently considering alternative brands for **BEER** .

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

I intend to purchase **BEER** ?

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

**Q10aa. What did you see on the ad?**

|                                   | Yes                   | No                    | Not Sure                         |
|-----------------------------------|-----------------------|-----------------------|----------------------------------|
| 5% ALC/VOL                        | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 4% ALC/VOL                        | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 3% ALC/VOL                        | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Approximately 1.0 Standard Drinks | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Approximately 1.4 Standard Drinks | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Approximately 1.2 Standard Drinks | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Manufactured in Thailand          | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Manufactured in Australia         | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Manufactured in South Africa      | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Manufactured in New Zealand       | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 330ml                             | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 355ml                             | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 500ml                             | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 375ml                             | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 440ml                             | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |

Continue

Figure A.5. 2e: (Web Page Five) Intermediate questionnaire for first ad.

## INSTRUCTIONS

1. Please click on "next" when you have been assigned a mobile phone and when you are ready to proceed.

Continue

Figure A.5.2f: (Web Page Six) Initiate time capture for second ad.

## INSTRUCTIONS

Please click "continue" once you have completed the task on the mobile phone.

Continue

Figure A.5.2g: (Web Page Seven) End ad viewing time capture for second ad.

## Section B.2

### Scenario Reminder

You have just run out of beer at home. You already know which type of beer you like. You are also used to the brand .

**Q10b. Please select any of the following that best describe your current position at the moment.**

I feel the need for **BEER** .

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

I would like to seek more information for **BEER** .

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

I am currently considering alternative brands for **BEER** .

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

I intend to purchase **BEER** ?

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

**Q10bb. What did you see on the ad?**

|                                   | Yes                   | No                    | Not Sure                         |
|-----------------------------------|-----------------------|-----------------------|----------------------------------|
| 5% ALC/VOL                        | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 4% ALC/VOL                        | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 3% ALC/VOL                        | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Approximately 1.0 Standard Drinks | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Approximately 1.4 Standard Drinks | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Approximately 1.2 Standard Drinks | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Manufactured in Thailand          | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Manufactured in Australia         | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Manufactured in South Africa      | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Manufactured in New Zealand       | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 330ml                             | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 355ml                             | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 500ml                             | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 375ml                             | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 440ml                             | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |

Continue

Figure A.5. 2h: (Web Page Eight) Intermediate questionnaire for second ad.

## INSTRUCTIONS

1. Please click on "next" when you have been assigned a mobile phone and when you are ready to proceed.

Continue

Figure A.5. 2i: (Web Page Nine) Initiate time capture for third ad.

## INSTRUCTIONS

Please click "continue" once you have completed the task on the mobile phone.

Continue

Figure A.5. 2j: (Web Page Ten) End ad viewing time capture for third ad.

## Section B.3

### Scenario Reminder

You have just run out of beer at home. You already know which type of beer you like. You are also used to the brand .

**Q10c. Please select any of the following that best describe your current position at the moment.**

I feel the need for **BEER** .

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

I would like to seek more information for **BEER** .

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

I am currently considering alternative brands for **BEER** .

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

I intend to purchase **BEER** ?

Agree ☐ ☐ ☐ ☐ ☐ ☐ ☐ Disagree

**Q10cc. What did you see on the ad?**

|                                   | Yes                   | No                    | Not Sure                         |
|-----------------------------------|-----------------------|-----------------------|----------------------------------|
| 5% ALC/VOL                        | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 4% ALC/VOL                        | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 3% ALC/VOL                        | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Approximately 1.0 Standard Drinks | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Approximately 1.4 Standard Drinks | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Approximately 1.2 Standard Drinks | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Manufactured in Thailand          | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Manufactured in Australia         | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Manufactured in South Africa      | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Manufactured in New Zealand       | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 330ml                             | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 355ml                             | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 500ml                             | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 375ml                             | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| 440ml                             | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |

[Continue](#)

Figure A.5.2k: (Web Page Eleven) Intermediate questionnaire for third ad.

**Q11. You will be asked a series of questions regarding the 3 different types of ads (Image Ad, Video Ad and Interactive Ad) that you have just viewed.**

**Q11.a. The following questions will be on the IMAGE AD**

**Q11.a. The following questions will be on the IMAGE AD**

**Q11.a.1. What brand was on the Image Ad?**



Don't Know

**Q11.a.2. Please indicate on the scale on how much you agree or disagree to the following statements about the *Image Ad*.**

[illegible]

**Q11.a.3. Please indicate on the scale on how much you agree or disagree to the following statements about the *Image Ad*.**

[illegible]

Q11.a.4. Were you familiar with mobile phone **Image Ad** prior to today?

- ☐ Yes
- ☐ No

Q11.a.5. Assuming you have a mobile phone, please rate your interest in receiving **Image Ads** on your mobile phone in the future?

[illegible]

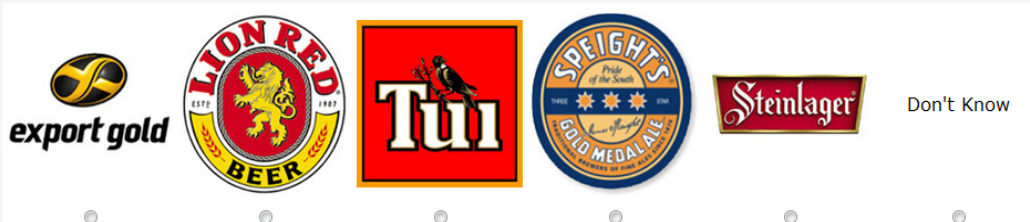
Figure A.5.21: (Web Page Twelve) Final questionnaire.  
Continue next three pages...

*Continue next three pages...*

Continue...

**Q11.b. The following questions will be on the VIDEO AD**

Q11.b.1. What brand was on the Video Ad?



Q11.b.2. Please indicate on the scale on how much you agree or disagree to the following statements about the Video Ad.

|                              | Completely Agree      |                       |                       | Neutral               |                       |                       | Completely Disagree   |
|------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I dislike the ad.            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The ad is appealing to me.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The ad is attractive to me.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The ad is interesting to me. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I think the ad is bad.       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q11.b.3. Please indicate on the scale on how much you agree or disagree to the following statements about the Video Ad.

|  | Completely Agree      |                       |                       | Neutral               |                       |                       | Completely Disagree   |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The ad was informative.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The information in the ad was easy to understand.                                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The information in the ad was relevant.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The information that was provided in the ad would help me in making a choice of BEER . | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q11.b.4. Were you familiar with mobile phone Video Ad prior to today?

- ☐ Yes  
☐ No

Q11.b.5. Assuming you have a mobile phone, please rate your interest in receiving Video Ads on your mobile phone in the future?

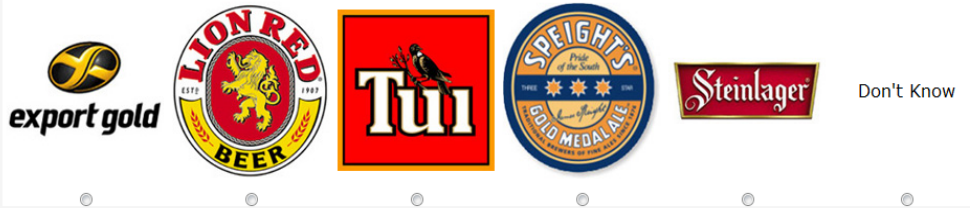
|                | Like                  |                       |                       | Neutral               |                       |                       | Dislike           |
|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------|
| Irritating     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not irritating    |
| Favourable     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not favourable    |
| Pleasant       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Unpleasant        |
| Likeable       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Unlikeable        |
| Positive       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Negative          |
| Overall liking | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Overall disliking |



Continue...

**Q11.c. The following questions will be on the *INTERACTIVE AD***

Q11.c.1 What brand was on the *Interactive Ad*?



Q11.c.2. Please indicate on the scale on how much you agree or disagree to the following statements about the *Interactive Ad*.

|                              | Completely Agree      |                       |                       | Neutral               |                       |                       | Completely Disagree   |
|------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I dislike the ad.            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The ad is appealing to me.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The ad is attractive to me.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The ad is interesting to me. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I think the ad is bad.       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q11.c.3. Please indicate on the scale on how much you agree or disagree to the following statements about the *Interactive Ad*.

|  | Completely Agree      |                       |                       | Neutral               |                       |                       | Completely Disagree   |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The ad was informative.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The information in the ad was easy to understand.                                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The information in the ad was relevant.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The information that was provided in the ad would help me in making a choice of BEER . | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q11.c.4. Were you familiar with mobile phone *Interactive Ads* prior to today?

- ☐ Yes  
☐ No

Q11.c.5. Assuming you have a mobile phone, please rate your interest in receiving *Interactive Ads* on your mobile phone in the future?

|                | Like                  |                       |                       | Neutral               |                       |                       | Dislike           |
|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------|
| Irritating     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not irritating    |
| Favourable     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not favourable    |
| Pleasant       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Unpleasant        |
| Likeable       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Unlikeable        |
| Positive       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Negative          |
| Overall liking | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Overall disliking |



Q12. How do you rate the mobile phone Nokia N95 (as shown in picture above)?

|              | Like                  |                       |                       | Neutral               |                       |                       | Dislike          |
|--------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------|
| Good         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Bad              |
| High quality | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Low quality      |
| Worth owning | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not worth owning |
| Impressive   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not impressive   |
| Advanced     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not advanced     |
| Dependable   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not dependable   |

Continue...

Q13. Indicate your opinion of the following brands:



**export gold**

0

Dislike the brand for this product      Neither like nor dislike      Like the brand for this product



0

Dislike the brand for this product      Neither like nor dislike      Like the brand for this product



0

Dislike the brand for this product      Neither like nor dislike      Like the brand for this product



0

Dislike the brand for this product      Neither like nor dislike      Like the brand for this product



0

Dislike the brand for this product      Neither like nor dislike      Like the brand for this product

Q14. Comments

(Please put in any comments that you would like to add)

\* Non-compulsory field

1. Please enter your age.

2. Please specify your gender.

- ☐ Male  
☐ Female

3. Are you or anyone in your family involved professionally in any of the following?

- ☐ Market research  
☐ Advertising  
☐ None of the above

4. Do you drink BEER?

- ☐ Yes  
☐ No



### Mobile Advertising

#### **Declaration of Consent to Participate**

I have read and understood the information provided about this research project.

I understand that my participation is voluntary and that I may withdraw at any time prior to publication of the findings.

I understand that any information or opinions I provide will be kept anonymous and confidential to the researcher and that any published or reported results will not identify me.

I understand that all data from this research will be stored securely at the University of Canterbury for five years following the study.

I have collected the incentive provided for completing this study.

Student username:  eg. ail13

☐ Please tick this box if you agree to participate in this research project

***Thank you for your contribution to this study.***

[Next](#)

Figure A.5.2m: (Web Page Thirteen) Declaration of consent to participate form.

**\*\*\* COMPLETE \*\*\***



Thank you for your participation.  
Please remember to collect your incentive for participating upon signing the consent form.

Figure A.5.2n: (Web Page Fourteen) Thank you for participating page.

Table A.5b: Random number or ID corresponding to experimental sequence.

| Stages  | Product |   | ID | Order | Vividness |   |   | Product | Brand | Brand | Brand | Complete | Date | Signature |
|---------|---------|---|----|-------|-----------|---|---|---------|-------|-------|-------|----------|------|-----------|
| Control | A       | 1 | 1  | 1     | I         | V | A | A       | 1     | 2     | 3     |          |      |           |
|         |         |   | 2  | 2     | I         | A | V | A       | 1     | 3     | 2     |          |      |           |
|         |         |   | 3  | 3     | V         | I | A | A       | 2     | 1     | 3     |          |      |           |
|         |         |   | 4  | 4     | V         | A | I | A       | 2     | 3     | 1     |          |      |           |
|         |         |   | 5  | 5     | A         | I | V | A       | 3     | 1     | 2     |          |      |           |
|         |         |   | 6  | 6     | A         | V | I | A       | 3     | 2     | 1     |          |      |           |
|         |         | 2 | 7  | 1     | I         | V | A | A       | 1     | 3     | 2     |          |      |           |
|         |         |   | 8  | 2     | I         | A | V | A       | 1     | 2     | 3     |          |      |           |
|         |         |   | 9  | 3     | V         | I | A | A       | 3     | 1     | 2     |          |      |           |
|         |         |   | 10 | 4     | V         | A | I | A       | 3     | 2     | 1     |          |      |           |
|         |         |   | 11 | 5     | A         | I | V | A       | 2     | 1     | 3     |          |      |           |
|         |         |   | 12 | 6     | A         | V | I | A       | 2     | 3     | 1     |          |      |           |
|         |         | 3 | 13 | 1     | I         | V | A | A       | 2     | 1     | 3     |          |      |           |
|         |         |   | 14 | 2     | I         | A | V | A       | 2     | 3     | 1     |          |      |           |
|         |         |   | 15 | 3     | V         | I | A | A       | 1     | 2     | 3     |          |      |           |
|         |         |   | 16 | 4     | V         | A | I | A       | 1     | 3     | 2     |          |      |           |
|         |         |   | 17 | 5     | A         | I | V | A       | 3     | 2     | 1     |          |      |           |
|         |         |   | 18 | 6     | A         | V | I | A       | 3     | 1     | 2     |          |      |           |
|         |         | 4 | 19 | 1     | I         | V | A | A       | 2     | 3     | 1     |          |      |           |
|         |         |   | 20 | 2     | I         | A | V | A       | 2     | 1     | 3     |          |      |           |
|         |         |   | 21 | 3     | V         | I | A | A       | 3     | 2     | 1     |          |      |           |
|         |         |   | 22 | 4     | V         | A | I | A       | 3     | 1     | 2     |          |      |           |
|         |         |   | 23 | 5     | A         | I | V | A       | 1     | 2     | 3     |          |      |           |
|         |         |   | 24 | 6     | A         | V | I | A       | 1     | 3     | 2     |          |      |           |
|         |         | 5 | 25 | 1     | I         | V | A | A       | 3     | 1     | 2     |          |      |           |
|         |         |   | 26 | 2     | I         | A | V | A       | 3     | 2     | 1     |          |      |           |
|         |         |   | 27 | 3     | V         | I | A | A       | 1     | 3     | 2     |          |      |           |
|         |         |   | 28 | 4     | V         | A | I | A       | 1     | 2     | 3     |          |      |           |
|         |         |   | 29 | 5     | A         | I | V | A       | 2     | 3     | 1     |          |      |           |
|         |         |   | 30 | 6     | A         | V | I | A       | 2     | 1     | 3     |          |      |           |
|         |         | 6 | 31 | 1     | I         | V | A | A       | 3     | 2     | 1     |          |      |           |
|         |         |   | 32 | 2     | I         | A | V | A       | 3     | 1     | 2     |          |      |           |
|         |         |   | 33 | 3     | V         | I | A | A       | 2     | 3     | 1     |          |      |           |
|         |         |   | 34 | 4     | V         | A | I | A       | 2     | 1     | 3     |          |      |           |
|         |         |   | 35 | 5     | A         | I | V | A       | 1     | 3     | 2     |          |      |           |
|         |         |   | 36 | 6     | A         | V | I | A       | 1     | 2     | 3     |          |      |           |
|         | D       | 1 | 37 | 1     | I         | V | A | D       | 1     | 2     | 3     |          |      |           |
|         |         |   | 38 | 2     | I         | A | V | D       | 1     | 3     | 2     |          |      |           |
|         |         |   | 39 | 3     | V         | I | A | D       | 2     | 1     | 3     |          |      |           |
|         |         |   | 40 | 4     | V         | A | I | D       | 2     | 3     | 1     |          |      |           |
|         |         |   | 41 | 5     | A         | I | V | D       | 3     | 1     | 2     |          |      |           |
|         |         |   | 42 | 6     | A         | V | I | D       | 3     | 2     | 1     |          |      |           |
|         |         | 2 | 43 | 1     | I         | V | A | D       | 1     | 3     | 2     |          |      |           |
|         |         |   | 44 | 2     | I         | A | V | D       | 1     | 2     | 3     |          |      |           |
|         |         |   | 45 | 3     | V         | I | A | D       | 3     | 1     | 2     |          |      |           |
|         |         |   | 46 | 4     | V         | A | I | D       | 3     | 2     | 1     |          |      |           |
|         |         |   | 47 | 5     | A         | I | V | D       | 2     | 1     | 3     |          |      |           |
|         |         |   | 48 | 6     | A         | V | I | D       | 2     | 3     | 1     |          |      |           |
|         |         | 3 | 49 | 1     | I         | V | A | D       | 2     | 1     | 3     |          |      |           |

|                  |   |   |     |    |   |   |   |   |   |   |   |   |  |  |  |
|------------------|---|---|-----|----|---|---|---|---|---|---|---|---|--|--|--|
| Need Recognition | A |   | 50  | 2  | I | A | V | D | 2 | 3 | 1 |   |  |  |  |
|                  |   |   | 51  | 3  | V | I | A | D | 1 | 2 | 3 |   |  |  |  |
|                  |   |   | 52  | 4  | V | A | I | D | 1 | 3 | 2 |   |  |  |  |
|                  |   |   | 53  | 5  | A | I | V | D | 3 | 2 | 1 |   |  |  |  |
|                  |   |   | 54  | 6  | A | V | I | D | 3 | 1 | 2 |   |  |  |  |
|                  |   | 4 | 55  | 1  | I | V | A | D | 2 | 3 | 1 |   |  |  |  |
|                  |   |   | 56  | 2  | I | A | V | D | 2 | 1 | 3 |   |  |  |  |
|                  |   |   | 57  | 3  | V | I | A | D | 3 | 2 | 1 |   |  |  |  |
|                  |   |   | 58  | 4  | V | A | I | D | 3 | 1 | 2 |   |  |  |  |
|                  |   |   | 59  | 5  | A | I | V | D | 1 | 2 | 3 |   |  |  |  |
|                  |   |   | 60  | 6  | A | V | I | D | 1 | 3 | 2 |   |  |  |  |
|                  |   | 5 | 61  | 1  | I | V | A | D | 3 | 1 | 2 |   |  |  |  |
|                  |   |   | 62  | 2  | I | A | V | D | 3 | 2 | 1 |   |  |  |  |
|                  |   |   | 63  | 3  | V | I | A | D | 1 | 3 | 2 |   |  |  |  |
|                  |   |   | 64  | 4  | V | A | I | D | 1 | 2 | 3 |   |  |  |  |
|                  |   |   | 65  | 5  | A | I | V | D | 2 | 3 | 1 |   |  |  |  |
|                  |   |   | 66  | 6  | A | V | I | D | 2 | 1 | 3 |   |  |  |  |
|                  |   | 6 | 67  | 1  | I | V | A | D | 3 | 2 | 1 |   |  |  |  |
|                  |   |   | 68  | 2  | I | A | V | D | 3 | 1 | 2 |   |  |  |  |
|                  |   |   | 69  | 3  | V | I | A | D | 2 | 3 | 1 |   |  |  |  |
|                  |   |   | 70  | 4  | V | A | I | D | 2 | 1 | 3 |   |  |  |  |
|                  |   |   | 71  | 5  | A | I | V | D | 1 | 3 | 2 |   |  |  |  |
|                  |   |   | 72  | 6  | A | V | I | D | 1 | 2 | 3 |   |  |  |  |
|                  |   |   | 1   | 73 | 1 | I | V | A | A | 1 | 2 | 3 |  |  |  |
|                  |   |   |     | 74 | 2 | I | A | V | A | 1 | 3 | 2 |  |  |  |
|                  |   |   |     | 75 | 3 | V | I | A | A | 2 | 1 | 3 |  |  |  |
|                  |   |   |     | 76 | 4 | V | A | I | A | 2 | 3 | 1 |  |  |  |
|                  |   |   |     | 77 | 5 | A | I | V | A | 3 | 1 | 2 |  |  |  |
|                  |   |   |     | 78 | 6 | A | V | I | A | 3 | 2 | 1 |  |  |  |
|                  |   |   | 2   | 79 | 1 | I | V | A | A | 1 | 3 | 2 |  |  |  |
|                  |   |   |     | 80 | 2 | I | A | V | A | 1 | 2 | 3 |  |  |  |
|                  |   |   |     | 81 | 3 | V | I | A | A | 3 | 1 | 2 |  |  |  |
|                  |   |   |     | 82 | 4 | V | A | I | A | 3 | 2 | 1 |  |  |  |
|                  |   |   |     | 83 | 5 | A | I | V | A | 2 | 1 | 3 |  |  |  |
|                  |   |   |     | 84 | 6 | A | V | I | A | 2 | 3 | 1 |  |  |  |
|                  |   |   | 3   | 85 | 1 | I | V | A | A | 2 | 1 | 3 |  |  |  |
|                  |   |   |     | 86 | 2 | I | A | V | A | 2 | 3 | 1 |  |  |  |
|                  |   |   |     | 87 | 3 | V | I | A | A | 1 | 2 | 3 |  |  |  |
|                  |   |   |     | 88 | 4 | V | A | I | A | 1 | 3 | 2 |  |  |  |
|                  |   |   |     | 89 | 5 | A | I | V | A | 3 | 2 | 1 |  |  |  |
|                  |   |   |     | 90 | 6 | A | V | I | A | 3 | 1 | 2 |  |  |  |
|                  |   |   | 4   | 91 | 1 | I | V | A | A | 2 | 3 | 1 |  |  |  |
|                  |   |   |     | 92 | 2 | I | A | V | A | 2 | 1 | 3 |  |  |  |
|                  |   |   |     | 93 | 3 | V | I | A | A | 3 | 2 | 1 |  |  |  |
|                  |   |   |     | 94 | 4 | V | A | I | A | 3 | 1 | 2 |  |  |  |
|                  |   |   |     | 95 | 5 | A | I | V | A | 1 | 2 | 3 |  |  |  |
|                  |   |   |     | 96 | 6 | A | V | I | A | 1 | 3 | 2 |  |  |  |
|                  |   | 5 | 97  | 1  | I | V | A | A | 3 | 1 | 2 |   |  |  |  |
|                  |   |   | 98  | 2  | I | A | V | A | 3 | 2 | 1 |   |  |  |  |
|                  |   |   | 99  | 3  | V | I | A | A | 1 | 3 | 2 |   |  |  |  |
|                  |   |   | 100 | 4  | V | A | I | A | 1 | 2 | 3 |   |  |  |  |
|                  |   |   | 101 | 5  | A | I | V | A | 2 | 3 | 1 |   |  |  |  |

|                    |   |   |     |     |   |   |   |   |   |   |   |   |  |  |
|--------------------|---|---|-----|-----|---|---|---|---|---|---|---|---|--|--|
|                    |   | 6 | 102 | 6   | A | V | I | A | 2 | 1 | 3 |   |  |  |
|                    |   |   | 103 | 1   | I | V | A | A | 3 | 2 | 1 |   |  |  |
|                    |   |   | 104 | 2   | I | A | V | A | 3 | 1 | 2 |   |  |  |
|                    |   |   | 105 | 3   | V | I | A | A | 2 | 3 | 1 |   |  |  |
|                    |   |   | 106 | 4   | V | A | I | A | 2 | 1 | 3 |   |  |  |
|                    |   |   | 107 | 5   | A | I | V | A | 1 | 3 | 2 |   |  |  |
|                    |   |   | 108 | 6   | A | V | I | A | 1 | 2 | 3 |   |  |  |
|                    |   | D | 1   | 109 | 1 | I | V | A | D | 1 | 2 | 3 |  |  |
|                    |   |   |     | 110 | 2 | I | A | V | D | 1 | 3 | 2 |  |  |
|                    |   |   |     | 111 | 3 | V | I | A | D | 2 | 1 | 3 |  |  |
|                    |   |   |     | 112 | 4 | V | A | I | D | 2 | 3 | 1 |  |  |
|                    |   |   |     | 113 | 5 | A | I | V | D | 3 | 1 | 2 |  |  |
|                    |   |   |     | 114 | 6 | A | V | I | D | 3 | 2 | 1 |  |  |
|                    |   |   | 2   | 115 | 1 | I | V | A | D | 1 | 3 | 2 |  |  |
|                    |   |   |     | 116 | 2 | I | A | V | D | 1 | 2 | 3 |  |  |
|                    |   |   |     | 117 | 3 | V | I | A | D | 3 | 1 | 2 |  |  |
|                    |   |   |     | 118 | 4 | V | A | I | D | 3 | 2 | 1 |  |  |
|                    |   |   |     | 119 | 5 | A | I | V | D | 2 | 1 | 3 |  |  |
|                    |   |   |     | 120 | 6 | A | V | I | D | 2 | 3 | 1 |  |  |
|                    |   |   | 3   | 121 | 1 | I | V | A | D | 2 | 1 | 3 |  |  |
|                    |   |   |     | 122 | 2 | I | A | V | D | 2 | 3 | 1 |  |  |
|                    |   |   |     | 123 | 3 | V | I | A | D | 1 | 2 | 3 |  |  |
|                    |   |   |     | 124 | 4 | V | A | I | D | 1 | 3 | 2 |  |  |
|                    |   |   |     | 125 | 5 | A | I | V | D | 3 | 2 | 1 |  |  |
|                    |   |   |     | 126 | 6 | A | V | I | D | 3 | 1 | 2 |  |  |
|                    |   |   | 4   | 127 | 1 | I | V | A | D | 2 | 3 | 1 |  |  |
|                    |   |   |     | 128 | 2 | I | A | V | D | 2 | 1 | 3 |  |  |
|                    |   |   |     | 129 | 3 | V | I | A | D | 3 | 2 | 1 |  |  |
|                    |   |   |     | 130 | 4 | V | A | I | D | 3 | 1 | 2 |  |  |
|                    |   |   |     | 131 | 5 | A | I | V | D | 1 | 2 | 3 |  |  |
|                    |   |   |     | 132 | 6 | A | V | I | D | 1 | 3 | 2 |  |  |
|                    |   |   | 5   | 133 | 1 | I | V | A | D | 3 | 1 | 2 |  |  |
|                    |   |   |     | 134 | 2 | I | A | V | D | 3 | 2 | 1 |  |  |
|                    |   |   |     | 135 | 3 | V | I | A | D | 1 | 3 | 2 |  |  |
|                    |   |   |     | 136 | 4 | V | A | I | D | 1 | 2 | 3 |  |  |
|                    |   |   |     | 137 | 5 | A | I | V | D | 2 | 3 | 1 |  |  |
|                    |   |   |     | 138 | 6 | A | V | I | D | 2 | 1 | 3 |  |  |
|                    |   |   | 6   | 139 | 1 | I | V | A | D | 3 | 2 | 1 |  |  |
|                    |   |   |     | 140 | 2 | I | A | V | D | 3 | 1 | 2 |  |  |
|                    |   |   |     | 141 | 3 | V | I | A | D | 2 | 3 | 1 |  |  |
|                    |   |   |     | 142 | 4 | V | A | I | D | 2 | 1 | 3 |  |  |
|                    |   |   |     | 143 | 5 | A | I | V | D | 1 | 3 | 2 |  |  |
|                    |   |   |     | 144 | 6 | A | V | I | D | 1 | 2 | 3 |  |  |
| Information Search | A | 1 | 145 | 1   | I | V | A | A | 1 | 2 | 3 |   |  |  |
|                    |   |   | 146 | 2   | I | A | V | A | 1 | 3 | 2 |   |  |  |
|                    |   |   | 147 | 3   | V | I | A | A | 2 | 1 | 3 |   |  |  |
|                    |   |   | 148 | 4   | V | A | I | A | 2 | 3 | 1 |   |  |  |
|                    |   |   | 149 | 5   | A | I | V | A | 3 | 1 | 2 |   |  |  |
|                    |   |   | 150 | 6   | A | V | I | A | 3 | 2 | 1 |   |  |  |
|                    |   | 2 | 151 | 1   | I | V | A | A | 1 | 3 | 2 |   |  |  |
|                    |   |   | 152 | 2   | I | A | V | A | 1 | 2 | 3 |   |  |  |
|                    |   |   | 153 | 3   | V | I | A | A | 3 | 1 | 2 |   |  |  |

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| Evaluation<br>of<br>Alternatives | A |   | 206 | 2 | I | A | V | D | 3 | 2 | 1 |  |  |  |
|                                  |   |   | 207 | 3 | V | I | A | D | 1 | 3 | 2 |  |  |  |
|                                  |   |   | 208 | 4 | V | A | I | D | 1 | 2 | 3 |  |  |  |
|                                  |   |   | 209 | 5 | A | I | V | D | 2 | 3 | 1 |  |  |  |
|                                  |   |   | 210 | 6 | A | V | I | D | 2 | 1 | 3 |  |  |  |
|                                  |   | 6 | 211 | 1 | I | V | A | D | 3 | 2 | 1 |  |  |  |
|                                  |   |   | 212 | 2 | I | A | V | D | 3 | 1 | 2 |  |  |  |
|                                  |   |   | 213 | 3 | V | I | A | D | 2 | 3 | 1 |  |  |  |
|                                  |   |   | 214 | 4 | V | A | I | D | 2 | 1 | 3 |  |  |  |
|                                  |   |   | 215 | 5 | A | I | V | D | 1 | 3 | 2 |  |  |  |
|                                  |   |   | 216 | 6 | A | V | I | D | 1 | 2 | 3 |  |  |  |
|                                  |   | 1 | 217 | 1 | I | V | A | A | 1 | 2 | 3 |  |  |  |
|                                  |   |   | 218 | 2 | I | A | V | A | 1 | 3 | 2 |  |  |  |
|                                  |   |   | 219 | 3 | V | I | A | A | 2 | 1 | 3 |  |  |  |
|                                  |   |   | 220 | 4 | V | A | I | A | 2 | 3 | 1 |  |  |  |
|                                  |   |   | 221 | 5 | A | I | V | A | 3 | 1 | 2 |  |  |  |
|                                  |   |   | 222 | 6 | A | V | I | A | 3 | 2 | 1 |  |  |  |
|                                  |   | 2 | 223 | 1 | I | V | A | A | 1 | 3 | 2 |  |  |  |
|                                  |   |   | 224 | 2 | I | A | V | A | 1 | 2 | 3 |  |  |  |
|                                  |   |   | 225 | 3 | V | I | A | A | 3 | 1 | 2 |  |  |  |
|                                  |   |   | 226 | 4 | V | A | I | A | 3 | 2 | 1 |  |  |  |
|                                  |   |   | 227 | 5 | A | I | V | A | 2 | 1 | 3 |  |  |  |
|                                  |   |   | 228 | 6 | A | V | I | A | 2 | 3 | 1 |  |  |  |
|                                  |   | 3 | 229 | 1 | I | V | A | A | 2 | 1 | 3 |  |  |  |
|                                  |   |   | 230 | 2 | I | A | V | A | 2 | 3 | 1 |  |  |  |
|                                  |   |   | 231 | 3 | V | I | A | A | 1 | 2 | 3 |  |  |  |
|                                  |   |   | 232 | 4 | V | A | I | A | 1 | 3 | 2 |  |  |  |
|                                  |   |   | 233 | 5 | A | I | V | A | 3 | 2 | 1 |  |  |  |
|                                  |   |   | 234 | 6 | A | V | I | A | 3 | 1 | 2 |  |  |  |
|                                  |   | 4 | 235 | 1 | I | V | A | A | 2 | 3 | 1 |  |  |  |
|                                  |   |   | 236 | 2 | I | A | V | A | 2 | 1 | 3 |  |  |  |
|                                  |   |   | 237 | 3 | V | I | A | A | 3 | 2 | 1 |  |  |  |
|                                  |   |   | 238 | 4 | V | A | I | A | 3 | 1 | 2 |  |  |  |
|                                  |   |   | 239 | 5 | A | I | V | A | 1 | 2 | 3 |  |  |  |
|                                  |   |   | 240 | 6 | A | V | I | A | 1 | 3 | 2 |  |  |  |
|                                  |   | 5 | 241 | 1 | I | V | A | A | 3 | 1 | 2 |  |  |  |
|                                  |   |   | 242 | 2 | I | A | V | A | 3 | 2 | 1 |  |  |  |
|                                  |   |   | 243 | 3 | V | I | A | A | 1 | 3 | 2 |  |  |  |
|                                  |   |   | 244 | 4 | V | A | I | A | 1 | 2 | 3 |  |  |  |
|                                  |   |   | 245 | 5 | A | I | V | A | 2 | 3 | 1 |  |  |  |
|                                  |   |   | 246 | 6 | A | V | I | A | 2 | 1 | 3 |  |  |  |
|                                  |   | 6 | 247 | 1 | I | V | A | A | 3 | 2 | 1 |  |  |  |
|                                  |   |   | 248 | 2 | I | A | V | A | 3 | 1 | 2 |  |  |  |
|                                  |   |   | 249 | 3 | V | I | A | A | 2 | 3 | 1 |  |  |  |
|                                  |   |   | 250 | 4 | V | A | I | A | 2 | 1 | 3 |  |  |  |
|                                  |   |   | 251 | 5 | A | I | V | A | 1 | 3 | 2 |  |  |  |
|                                  |   |   | 252 | 6 | A | V | I | A | 1 | 2 | 3 |  |  |  |
|                                  | D | 1 | 253 | 1 | I | V | A | D | 1 | 2 | 3 |  |  |  |
|                                  |   |   | 254 | 2 | I | A | V | D | 1 | 3 | 2 |  |  |  |
|                                  |   |   | 255 | 3 | V | I | A | D | 2 | 1 | 3 |  |  |  |
|                                  |   |   | 256 | 4 | V | A | I | D | 2 | 3 | 1 |  |  |  |
|                                  |   |   | 257 | 5 | A | I | V | D | 3 | 1 | 2 |  |  |  |



|         |   |   |     |     |   |   |   |   |   |   |   |   |  |  |
|---------|---|---|-----|-----|---|---|---|---|---|---|---|---|--|--|
|         |   |   | 258 | 6   | A | V | I | D | 3 | 2 | 1 |   |  |  |
|         |   |   | 2   | 259 | 1 | I | V | A | D | 1 | 3 | 2 |  |  |
|         |   |   |     | 260 | 2 | I | A | V | D | 1 | 2 | 3 |  |  |
|         |   |   |     | 261 | 3 | V | I | A | D | 3 | 1 | 2 |  |  |
|         |   |   |     | 262 | 4 | V | A | I | D | 3 | 2 | 1 |  |  |
|         |   |   |     | 263 | 5 | A | I | V | D | 2 | 1 | 3 |  |  |
|         |   |   |     | 264 | 6 | A | V | I | D | 2 | 3 | 1 |  |  |
|         |   | 3 | 265 | 1   | I | V | A | D | 2 | 1 | 3 |   |  |  |
|         |   |   | 266 | 2   | I | A | V | D | 2 | 3 | 1 |   |  |  |
|         |   |   | 267 | 3   | V | I | A | D | 1 | 2 | 3 |   |  |  |
|         |   |   | 268 | 4   | V | A | I | D | 1 | 3 | 2 |   |  |  |
|         |   |   | 269 | 5   | A | I | V | D | 3 | 2 | 1 |   |  |  |
|         |   |   | 270 | 6   | A | V | I | D | 3 | 1 | 2 |   |  |  |
|         |   | 4 | 271 | 1   | I | V | A | D | 2 | 3 | 1 |   |  |  |
|         |   |   | 272 | 2   | I | A | V | D | 2 | 1 | 3 |   |  |  |
|         |   |   | 273 | 3   | V | I | A | D | 3 | 2 | 1 |   |  |  |
|         |   |   | 274 | 4   | V | A | I | D | 3 | 1 | 2 |   |  |  |
|         |   |   | 275 | 5   | A | I | V | D | 1 | 2 | 3 |   |  |  |
|         |   |   | 276 | 6   | A | V | I | D | 1 | 3 | 2 |   |  |  |
|         |   | 5 | 277 | 1   | I | V | A | D | 3 | 1 | 2 |   |  |  |
|         |   |   | 278 | 2   | I | A | V | D | 3 | 2 | 1 |   |  |  |
|         |   |   | 279 | 3   | V | I | A | D | 1 | 3 | 2 |   |  |  |
|         |   |   | 280 | 4   | V | A | I | D | 1 | 2 | 3 |   |  |  |
|         |   |   | 281 | 5   | A | I | V | D | 2 | 3 | 1 |   |  |  |
|         |   |   | 282 | 6   | A | V | I | D | 2 | 1 | 3 |   |  |  |
|         |   | 6 | 283 | 1   | I | V | A | D | 3 | 2 | 1 |   |  |  |
|         |   |   | 284 | 2   | I | A | V | D | 3 | 1 | 2 |   |  |  |
|         |   |   | 285 | 3   | V | I | A | D | 2 | 3 | 1 |   |  |  |
|         |   |   | 286 | 4   | V | A | I | D | 2 | 1 | 3 |   |  |  |
|         |   |   | 287 | 5   | A | I | V | D | 1 | 3 | 2 |   |  |  |
|         |   |   | 288 | 6   | A | V | I | D | 1 | 2 | 3 |   |  |  |
| Control | A | 1 | 1   | 1   | I | V | A | A | 1 | 2 | 3 |   |  |  |
|         |   |   | 2   | 2   | I | A | V | A | 1 | 3 | 2 |   |  |  |
|         |   |   | 3   | 3   | V | I | A | A | 2 | 1 | 3 |   |  |  |
|         |   |   | 4   | 4   | V | A | I | A | 2 | 3 | 1 |   |  |  |
|         |   |   | 5   | 5   | A | I | V | A | 3 | 1 | 2 |   |  |  |
|         |   |   | 6   | 6   | A | V | I | A | 3 | 2 | 1 |   |  |  |
|         |   | 2 | 7   | 1   | I | V | A | A | 1 | 3 | 2 |   |  |  |
|         |   |   | 8   | 2   | I | A | V | A | 1 | 2 | 3 |   |  |  |
|         |   |   | 9   | 3   | V | I | A | A | 3 | 1 | 2 |   |  |  |
|         |   |   | 10  | 4   | V | A | I | A | 3 | 2 | 1 |   |  |  |
|         |   |   | 11  | 5   | A | I | V | A | 2 | 1 | 3 |   |  |  |
|         |   |   | 12  | 6   | A | V | I | A | 2 | 3 | 1 |   |  |  |
|         |   | 3 | 13  | 1   | I | V | A | A | 2 | 1 | 3 |   |  |  |
|         |   |   | 14  | 2   | I | A | V | A | 2 | 3 | 1 |   |  |  |
|         |   |   | 15  | 3   | V | I | A | A | 1 | 2 | 3 |   |  |  |
|         |   |   | 16  | 4   | V | A | I | A | 1 | 3 | 2 |   |  |  |
|         |   |   | 17  | 5   | A | I | V | A | 3 | 2 | 1 |   |  |  |
|         |   |   | 18  | 6   | A | V | I | A | 3 | 1 | 2 |   |  |  |
|         |   | 4 | 19  | 1   | I | V | A | A | 2 | 3 | 1 |   |  |  |
|         |   |   | 20  | 2   | I | A | V | A | 2 | 1 | 3 |   |  |  |
|         |   |   | 21  | 3   | V | I | A | A | 3 | 2 | 1 |   |  |  |

|      |   |   |    |   |   |   |   |   |   |   |   |  |  |  |
|------|---|---|----|---|---|---|---|---|---|---|---|--|--|--|
| Need | D | 5 | 22 | 4 | V | A | I | A | 3 | 1 | 2 |  |  |  |
|      |   |   | 23 | 5 | A | I | V | A | 1 | 2 | 3 |  |  |  |
|      |   |   | 24 | 6 | A | V | I | A | 1 | 3 | 2 |  |  |  |
|      |   |   | 25 | 1 | I | V | A | A | 3 | 1 | 2 |  |  |  |
|      |   |   | 26 | 2 | I | A | V | A | 3 | 2 | 1 |  |  |  |
|      |   |   | 27 | 3 | V | I | A | A | 1 | 3 | 2 |  |  |  |
|      |   |   | 28 | 4 | V | A | I | A | 1 | 2 | 3 |  |  |  |
|      |   |   | 29 | 5 | A | I | V | A | 2 | 3 | 1 |  |  |  |
|      |   |   | 30 | 6 | A | V | I | A | 2 | 1 | 3 |  |  |  |
|      |   | 6 | 31 | 1 | I | V | A | A | 3 | 2 | 1 |  |  |  |
|      |   |   | 32 | 2 | I | A | V | A | 3 | 1 | 2 |  |  |  |
|      |   |   | 33 | 3 | V | I | A | A | 2 | 3 | 1 |  |  |  |
|      |   |   | 34 | 4 | V | A | I | A | 2 | 1 | 3 |  |  |  |
|      |   |   | 35 | 5 | A | I | V | A | 1 | 3 | 2 |  |  |  |
|      |   |   | 36 | 6 | A | V | I | A | 1 | 2 | 3 |  |  |  |
|      | D | 1 | 37 | 1 | I | V | A | D | 1 | 2 | 3 |  |  |  |
|      |   |   | 38 | 2 | I | A | V | D | 1 | 3 | 2 |  |  |  |
|      |   |   | 39 | 3 | V | I | A | D | 2 | 1 | 3 |  |  |  |
|      |   |   | 40 | 4 | V | A | I | D | 2 | 3 | 1 |  |  |  |
|      |   |   | 41 | 5 | A | I | V | D | 3 | 1 | 2 |  |  |  |
|      |   |   | 42 | 6 | A | V | I | D | 3 | 2 | 1 |  |  |  |
|      |   | 2 | 43 | 1 | I | V | A | D | 1 | 3 | 2 |  |  |  |
|      |   |   | 44 | 2 | I | A | V | D | 1 | 2 | 3 |  |  |  |
|      |   |   | 45 | 3 | V | I | A | D | 3 | 1 | 2 |  |  |  |
|      |   |   | 46 | 4 | V | A | I | D | 3 | 2 | 1 |  |  |  |
|      |   |   | 47 | 5 | A | I | V | D | 2 | 1 | 3 |  |  |  |
|      |   |   | 48 | 6 | A | V | I | D | 2 | 3 | 1 |  |  |  |
|      |   | 3 | 49 | 1 | I | V | A | D | 2 | 1 | 3 |  |  |  |
|      |   |   | 50 | 2 | I | A | V | D | 2 | 3 | 1 |  |  |  |
|      |   |   | 51 | 3 | V | I | A | D | 1 | 2 | 3 |  |  |  |
|      |   |   | 52 | 4 | V | A | I | D | 1 | 3 | 2 |  |  |  |
|      |   |   | 53 | 5 | A | I | V | D | 3 | 2 | 1 |  |  |  |
|      |   |   | 54 | 6 | A | V | I | D | 3 | 1 | 2 |  |  |  |
|      |   | 4 | 55 | 1 | I | V | A | D | 2 | 3 | 1 |  |  |  |
|      |   |   | 56 | 2 | I | A | V | D | 2 | 1 | 3 |  |  |  |
|      |   |   | 57 | 3 | V | I | A | D | 3 | 2 | 1 |  |  |  |
|      |   |   | 58 | 4 | V | A | I | D | 3 | 1 | 2 |  |  |  |
|      |   |   | 59 | 5 | A | I | V | D | 1 | 2 | 3 |  |  |  |
|      |   |   | 60 | 6 | A | V | I | D | 1 | 3 | 2 |  |  |  |
|      |   | 5 | 61 | 1 | I | V | A | D | 3 | 1 | 2 |  |  |  |
|      |   |   | 62 | 2 | I | A | V | D | 3 | 2 | 1 |  |  |  |
|      |   |   | 63 | 3 | V | I | A | D | 1 | 3 | 2 |  |  |  |
|      |   |   | 64 | 4 | V | A | I | D | 1 | 2 | 3 |  |  |  |
|      |   |   | 65 | 5 | A | I | V | D | 2 | 3 | 1 |  |  |  |
|      |   |   | 66 | 6 | A | V | I | D | 2 | 1 | 3 |  |  |  |
|      |   | 6 | 67 | 1 | I | V | A | D | 3 | 2 | 1 |  |  |  |
|      |   |   | 68 | 2 | I | A | V | D | 3 | 1 | 2 |  |  |  |
|      |   |   | 69 | 3 | V | I | A | D | 2 | 3 | 1 |  |  |  |
|      |   |   | 70 | 4 | V | A | I | D | 2 | 1 | 3 |  |  |  |
|      |   |   | 71 | 5 | A | I | V | D | 1 | 3 | 2 |  |  |  |
|      |   |   | 72 | 6 | A | V | I | D | 1 | 2 | 3 |  |  |  |
|      | A | 1 | 73 | 1 | I | V | A | A | 1 | 2 | 3 |  |  |  |

|             |  |  |   |     |     |   |   |   |   |   |   |   |   |  |  |  |
|-------------|--|--|---|-----|-----|---|---|---|---|---|---|---|---|--|--|--|
| Recognition |  |  |   | 74  | 2   | I | A | V | A | 1 | 3 | 2 |   |  |  |  |
|             |  |  |   | 75  | 3   | V | I | A | A | 2 | 1 | 3 |   |  |  |  |
|             |  |  |   | 76  | 4   | V | A | I | A | 2 | 3 | 1 |   |  |  |  |
|             |  |  |   | 77  | 5   | A | I | V | A | 3 | 1 | 2 |   |  |  |  |
|             |  |  |   | 78  | 6   | A | V | I | A | 3 | 2 | 1 |   |  |  |  |
|             |  |  | 2 | 79  | 1   | I | V | A | A | 1 | 3 | 2 |   |  |  |  |
|             |  |  |   | 80  | 2   | I | A | V | A | 1 | 2 | 3 |   |  |  |  |
|             |  |  |   | 81  | 3   | V | I | A | A | 3 | 1 | 2 |   |  |  |  |
|             |  |  |   | 82  | 4   | V | A | I | A | 3 | 2 | 1 |   |  |  |  |
|             |  |  |   | 83  | 5   | A | I | V | A | 2 | 1 | 3 |   |  |  |  |
|             |  |  |   | 84  | 6   | A | V | I | A | 2 | 3 | 1 |   |  |  |  |
|             |  |  | 3 | 85  | 1   | I | V | A | A | 2 | 1 | 3 |   |  |  |  |
|             |  |  |   | 86  | 2   | I | A | V | A | 2 | 3 | 1 |   |  |  |  |
|             |  |  |   | 87  | 3   | V | I | A | A | 1 | 2 | 3 |   |  |  |  |
|             |  |  |   | 88  | 4   | V | A | I | A | 1 | 3 | 2 |   |  |  |  |
|             |  |  |   | 89  | 5   | A | I | V | A | 3 | 2 | 1 |   |  |  |  |
|             |  |  |   | 90  | 6   | A | V | I | A | 3 | 1 | 2 |   |  |  |  |
|             |  |  | 4 | 91  | 1   | I | V | A | A | 2 | 3 | 1 |   |  |  |  |
|             |  |  |   | 92  | 2   | I | A | V | A | 2 | 1 | 3 |   |  |  |  |
|             |  |  |   | 93  | 3   | V | I | A | A | 3 | 2 | 1 |   |  |  |  |
|             |  |  |   | 94  | 4   | V | A | I | A | 3 | 1 | 2 |   |  |  |  |
|             |  |  |   | 95  | 5   | A | I | V | A | 1 | 2 | 3 |   |  |  |  |
|             |  |  |   | 96  | 6   | A | V | I | A | 1 | 3 | 2 |   |  |  |  |
|             |  |  | 5 | 97  | 1   | I | V | A | A | 3 | 1 | 2 |   |  |  |  |
|             |  |  |   | 98  | 2   | I | A | V | A | 3 | 2 | 1 |   |  |  |  |
|             |  |  |   | 99  | 3   | V | I | A | A | 1 | 3 | 2 |   |  |  |  |
|             |  |  |   | 100 | 4   | V | A | I | A | 1 | 2 | 3 |   |  |  |  |
|             |  |  |   | 101 | 5   | A | I | V | A | 2 | 3 | 1 |   |  |  |  |
|             |  |  |   | 102 | 6   | A | V | I | A | 2 | 1 | 3 |   |  |  |  |
|             |  |  | 6 | 103 | 1   | I | V | A | A | 3 | 2 | 1 |   |  |  |  |
|             |  |  |   | 104 | 2   | I | A | V | A | 3 | 1 | 2 |   |  |  |  |
|             |  |  |   | 105 | 3   | V | I | A | A | 2 | 3 | 1 |   |  |  |  |
|             |  |  |   | 106 | 4   | V | A | I | A | 2 | 1 | 3 |   |  |  |  |
|             |  |  |   | 107 | 5   | A | I | V | A | 1 | 3 | 2 |   |  |  |  |
|             |  |  |   | 108 | 6   | A | V | I | A | 1 | 2 | 3 |   |  |  |  |
|             |  |  | D | 1   | 109 | 1 | I | V | A | D | 1 | 2 | 3 |  |  |  |
|             |  |  |   |     | 110 | 2 | I | A | V | D | 1 | 3 | 2 |  |  |  |
|             |  |  |   |     | 111 | 3 | V | I | A | D | 2 | 1 | 3 |  |  |  |
|             |  |  |   |     | 112 | 4 | V | A | I | D | 2 | 3 | 1 |  |  |  |
|             |  |  |   |     | 113 | 5 | A | I | V | D | 3 | 1 | 2 |  |  |  |
|             |  |  |   |     | 114 | 6 | A | V | I | D | 3 | 2 | 1 |  |  |  |
|             |  |  |   | 2   | 115 | 1 | I | V | A | D | 1 | 3 | 2 |  |  |  |
|             |  |  |   |     | 116 | 2 | I | A | V | D | 1 | 2 | 3 |  |  |  |
|             |  |  |   |     | 117 | 3 | V | I | A | D | 3 | 1 | 2 |  |  |  |
|             |  |  |   |     | 118 | 4 | V | A | I | D | 3 | 2 | 1 |  |  |  |
|             |  |  |   |     | 119 | 5 | A | I | V | D | 2 | 1 | 3 |  |  |  |
|             |  |  |   |     | 120 | 6 | A | V | I | D | 2 | 3 | 1 |  |  |  |
|             |  |  |   | 3   | 121 | 1 | I | V | A | D | 2 | 1 | 3 |  |  |  |
|             |  |  |   |     | 122 | 2 | I | A | V | D | 2 | 3 | 1 |  |  |  |
|             |  |  |   |     | 123 | 3 | V | I | A | D | 1 | 2 | 3 |  |  |  |
|             |  |  |   |     | 124 | 4 | V | A | I | D | 1 | 3 | 2 |  |  |  |
|             |  |  |   |     | 125 | 5 | A | I | V | D | 3 | 2 | 1 |  |  |  |

|                    |   |  |  |     |     |   |   |   |   |   |   |   |   |  |  |
|--------------------|---|--|--|-----|-----|---|---|---|---|---|---|---|---|--|--|
|                    |   |  |  | 126 | 6   | A | V | I | D | 3 | 1 | 2 |   |  |  |
|                    |   |  |  | 4   | 127 | 1 | I | V | A | D | 2 | 3 | 1 |  |  |
|                    |   |  |  |     | 128 | 2 | I | A | V | D | 2 | 1 | 3 |  |  |
|                    |   |  |  |     | 129 | 3 | V | I | A | D | 3 | 2 | 1 |  |  |
|                    |   |  |  |     | 130 | 4 | V | A | I | D | 3 | 1 | 2 |  |  |
|                    |   |  |  |     | 131 | 5 | A | I | V | D | 1 | 2 | 3 |  |  |
|                    |   |  |  |     | 132 | 6 | A | V | I | D | 1 | 3 | 2 |  |  |
|                    |   |  |  | 5   | 133 | 1 | I | V | A | D | 3 | 1 | 2 |  |  |
|                    |   |  |  |     | 134 | 2 | I | A | V | D | 3 | 2 | 1 |  |  |
|                    |   |  |  |     | 135 | 3 | V | I | A | D | 1 | 3 | 2 |  |  |
|                    |   |  |  |     | 136 | 4 | V | A | I | D | 1 | 2 | 3 |  |  |
|                    |   |  |  |     | 137 | 5 | A | I | V | D | 2 | 3 | 1 |  |  |
|                    |   |  |  |     | 138 | 6 | A | V | I | D | 2 | 1 | 3 |  |  |
|                    |   |  |  | 6   | 139 | 1 | I | V | A | D | 3 | 2 | 1 |  |  |
|                    |   |  |  |     | 140 | 2 | I | A | V | D | 3 | 1 | 2 |  |  |
|                    |   |  |  |     | 141 | 3 | V | I | A | D | 2 | 3 | 1 |  |  |
|                    |   |  |  |     | 142 | 4 | V | A | I | D | 2 | 1 | 3 |  |  |
|                    |   |  |  |     | 143 | 5 | A | I | V | D | 1 | 3 | 2 |  |  |
|                    |   |  |  |     | 144 | 6 | A | V | I | D | 1 | 2 | 3 |  |  |
| Information Search | A |  |  | 1   | 145 | 1 | I | V | A | A | 1 | 2 | 3 |  |  |
|                    |   |  |  |     | 146 | 2 | I | A | V | A | 1 | 3 | 2 |  |  |
|                    |   |  |  |     | 147 | 3 | V | I | A | A | 2 | 1 | 3 |  |  |
|                    |   |  |  |     | 148 | 4 | V | A | I | A | 2 | 3 | 1 |  |  |
|                    |   |  |  |     | 149 | 5 | A | I | V | A | 3 | 1 | 2 |  |  |
|                    |   |  |  |     | 150 | 6 | A | V | I | A | 3 | 2 | 1 |  |  |
|                    |   |  |  | 2   | 151 | 1 | I | V | A | A | 1 | 3 | 2 |  |  |
|                    |   |  |  |     | 152 | 2 | I | A | V | A | 1 | 2 | 3 |  |  |
|                    |   |  |  |     | 153 | 3 | V | I | A | A | 3 | 1 | 2 |  |  |
|                    |   |  |  |     | 154 | 4 | V | A | I | A | 3 | 2 | 1 |  |  |
|                    |   |  |  |     | 155 | 5 | A | I | V | A | 2 | 1 | 3 |  |  |
|                    |   |  |  |     | 156 | 6 | A | V | I | A | 2 | 3 | 1 |  |  |
|                    |   |  |  | 3   | 157 | 1 | I | V | A | A | 2 | 1 | 3 |  |  |
|                    |   |  |  |     | 158 | 2 | I | A | V | A | 2 | 3 | 1 |  |  |
|                    |   |  |  |     | 159 | 3 | V | I | A | A | 1 | 2 | 3 |  |  |
|                    |   |  |  |     | 160 | 4 | V | A | I | A | 1 | 3 | 2 |  |  |
|                    |   |  |  |     | 161 | 5 | A | I | V | A | 3 | 2 | 1 |  |  |
|                    |   |  |  |     | 162 | 6 | A | V | I | A | 3 | 1 | 2 |  |  |
|                    |   |  |  | 4   | 163 | 1 | I | V | A | A | 2 | 3 | 1 |  |  |
|                    |   |  |  |     | 164 | 2 | I | A | V | A | 2 | 1 | 3 |  |  |
|                    |   |  |  |     | 165 | 3 | V | I | A | A | 3 | 2 | 1 |  |  |
|                    |   |  |  |     | 166 | 4 | V | A | I | A | 3 | 1 | 2 |  |  |
|                    |   |  |  |     | 167 | 5 | A | I | V | A | 1 | 2 | 3 |  |  |
|                    |   |  |  |     | 168 | 6 | A | V | I | A | 1 | 3 | 2 |  |  |
|                    |   |  |  | 5   | 169 | 1 | I | V | A | A | 3 | 1 | 2 |  |  |
|                    |   |  |  |     | 170 | 2 | I | A | V | A | 3 | 2 | 1 |  |  |
|                    |   |  |  |     | 171 | 3 | V | I | A | A | 1 | 3 | 2 |  |  |
|                    |   |  |  |     | 172 | 4 | V | A | I | A | 1 | 2 | 3 |  |  |
|                    |   |  |  |     | 173 | 5 | A | I | V | A | 2 | 3 | 1 |  |  |
|                    |   |  |  |     | 174 | 6 | A | V | I | A | 2 | 1 | 3 |  |  |
|                    |   |  |  | 6   | 175 | 1 | I | V | A | A | 3 | 2 | 1 |  |  |
|                    |   |  |  |     | 176 | 2 | I | A | V | A | 3 | 1 | 2 |  |  |
|                    |   |  |  |     | 177 | 3 | V | I | A | A | 2 | 3 | 1 |  |  |

|                            |   |   |     |   |   |   |   |   |   |   |   |  |  |  |
|----------------------------|---|---|-----|---|---|---|---|---|---|---|---|--|--|--|
|                            |   |   | 178 | 4 | V | A | I | A | 2 | 1 | 3 |  |  |  |
|                            |   |   | 179 | 5 | A | I | V | A | 1 | 3 | 2 |  |  |  |
| D                          |   | 1 | 180 | 6 | A | V | I | A | 1 | 2 | 3 |  |  |  |
|                            |   |   | 181 | 1 | I | V | A | D | 1 | 2 | 3 |  |  |  |
|                            |   |   | 182 | 2 | I | A | V | D | 1 | 3 | 2 |  |  |  |
|                            |   |   | 183 | 3 | V | I | A | D | 2 | 1 | 3 |  |  |  |
|                            |   |   | 184 | 4 | V | A | I | D | 2 | 3 | 1 |  |  |  |
|                            |   |   | 185 | 5 | A | I | V | D | 3 | 1 | 2 |  |  |  |
|                            |   |   | 186 | 6 | A | V | I | D | 3 | 2 | 1 |  |  |  |
|                            |   | 2 | 187 | 1 | I | V | A | D | 1 | 3 | 2 |  |  |  |
|                            |   |   | 188 | 2 | I | A | V | D | 1 | 2 | 3 |  |  |  |
|                            |   |   | 189 | 3 | V | I | A | D | 3 | 1 | 2 |  |  |  |
|                            |   |   | 190 | 4 | V | A | I | D | 3 | 2 | 1 |  |  |  |
|                            |   |   | 191 | 5 | A | I | V | D | 2 | 1 | 3 |  |  |  |
|                            |   |   | 192 | 6 | A | V | I | D | 2 | 3 | 1 |  |  |  |
|                            |   | 3 | 193 | 1 | I | V | A | D | 2 | 1 | 3 |  |  |  |
|                            |   |   | 194 | 2 | I | A | V | D | 2 | 3 | 1 |  |  |  |
|                            |   |   | 195 | 3 | V | I | A | D | 1 | 2 | 3 |  |  |  |
|                            |   |   | 196 | 4 | V | A | I | D | 1 | 3 | 2 |  |  |  |
|                            |   |   | 197 | 5 | A | I | V | D | 3 | 2 | 1 |  |  |  |
|                            |   |   | 198 | 6 | A | V | I | D | 3 | 1 | 2 |  |  |  |
|                            |   | 4 | 199 | 1 | I | V | A | D | 2 | 3 | 1 |  |  |  |
|                            |   |   | 200 | 2 | I | A | V | D | 2 | 1 | 3 |  |  |  |
|                            |   |   | 201 | 3 | V | I | A | D | 3 | 2 | 1 |  |  |  |
|                            |   |   | 202 | 4 | V | A | I | D | 3 | 1 | 2 |  |  |  |
|                            |   |   | 203 | 5 | A | I | V | D | 1 | 2 | 3 |  |  |  |
|                            |   |   | 204 | 6 | A | V | I | D | 1 | 3 | 2 |  |  |  |
|                            |   | 5 | 205 | 1 | I | V | A | D | 3 | 1 | 2 |  |  |  |
|                            |   |   | 206 | 2 | I | A | V | D | 3 | 2 | 1 |  |  |  |
|                            |   |   | 207 | 3 | V | I | A | D | 1 | 3 | 2 |  |  |  |
|                            |   |   | 208 | 4 | V | A | I | D | 1 | 2 | 3 |  |  |  |
|                            |   |   | 209 | 5 | A | I | V | D | 2 | 3 | 1 |  |  |  |
|                            |   |   | 210 | 6 | A | V | I | D | 2 | 1 | 3 |  |  |  |
|                            |   | 6 | 211 | 1 | I | V | A | D | 3 | 2 | 1 |  |  |  |
|                            |   |   | 212 | 2 | I | A | V | D | 3 | 1 | 2 |  |  |  |
|                            |   |   | 213 | 3 | V | I | A | D | 2 | 3 | 1 |  |  |  |
|                            |   |   | 214 | 4 | V | A | I | D | 2 | 1 | 3 |  |  |  |
|                            |   |   | 215 | 5 | A | I | V | D | 1 | 3 | 2 |  |  |  |
|                            |   |   | 216 | 6 | A | V | I | D | 1 | 2 | 3 |  |  |  |
| Evaluation of Alternatives | A | 1 | 217 | 1 | I | V | A | A | 1 | 2 | 3 |  |  |  |
|                            |   |   | 218 | 2 | I | A | V | A | 1 | 3 | 2 |  |  |  |
|                            |   |   | 219 | 3 | V | I | A | A | 2 | 1 | 3 |  |  |  |
|                            |   |   | 220 | 4 | V | A | I | A | 2 | 3 | 1 |  |  |  |
|                            |   |   | 221 | 5 | A | I | V | A | 3 | 1 | 2 |  |  |  |
|                            |   |   | 222 | 6 | A | V | I | A | 3 | 2 | 1 |  |  |  |
|                            |   | 2 | 223 | 1 | I | V | A | A | 1 | 3 | 2 |  |  |  |
|                            |   |   | 224 | 2 | I | A | V | A | 1 | 2 | 3 |  |  |  |
|                            |   |   | 225 | 3 | V | I | A | A | 3 | 1 | 2 |  |  |  |
|                            |   |   | 226 | 4 | V | A | I | A | 3 | 2 | 1 |  |  |  |
|                            |   |   | 227 | 5 | A | I | V | A | 2 | 1 | 3 |  |  |  |
|                            |   |   | 228 | 6 | A | V | I | A | 2 | 3 | 1 |  |  |  |
|                            |   | 3 | 229 | 1 | I | V | A | A | 2 | 1 | 3 |  |  |  |

|     |     |     |     |     |   |   |   |   |   |   |   |   |  |  |  |
|-----|-----|-----|-----|-----|---|---|---|---|---|---|---|---|--|--|--|
| D   |     | 4   | 230 | 2   | I | A | V | A | 2 | 3 | 1 |   |  |  |  |
|     |     |     | 231 | 3   | V | I | A | A | 1 | 2 | 3 |   |  |  |  |
|     |     |     | 232 | 4   | V | A | I | A | 1 | 3 | 2 |   |  |  |  |
|     |     |     | 233 | 5   | A | I | V | A | 3 | 2 | 1 |   |  |  |  |
|     |     |     | 234 | 6   | A | V | I | A | 3 | 1 | 2 |   |  |  |  |
|     |     | 5   | 235 | 1   | I | V | A | A | 2 | 3 | 1 |   |  |  |  |
|     |     |     | 236 | 2   | I | A | V | A | 2 | 1 | 3 |   |  |  |  |
|     |     |     | 237 | 3   | V | I | A | A | 3 | 2 | 1 |   |  |  |  |
|     |     |     | 238 | 4   | V | A | I | A | 3 | 1 | 2 |   |  |  |  |
|     |     |     | 239 | 5   | A | I | V | A | 1 | 2 | 3 |   |  |  |  |
|     |     |     | 240 | 6   | A | V | I | A | 1 | 3 | 2 |   |  |  |  |
|     |     | 6   | 241 | 1   | I | V | A | A | 3 | 1 | 2 |   |  |  |  |
|     |     |     | 242 | 2   | I | A | V | A | 3 | 2 | 1 |   |  |  |  |
|     |     |     | 243 | 3   | V | I | A | A | 1 | 3 | 2 |   |  |  |  |
|     |     |     | 244 | 4   | V | A | I | A | 1 | 2 | 3 |   |  |  |  |
|     |     |     | 245 | 5   | A | I | V | A | 2 | 3 | 1 |   |  |  |  |
|     |     |     | 246 | 6   | A | V | I | A | 2 | 1 | 3 |   |  |  |  |
|     |     | 1   | 2   | 247 | 1 | I | V | A | A | 3 | 2 | 1 |  |  |  |
|     |     |     |     | 248 | 2 | I | A | V | A | 3 | 1 | 2 |  |  |  |
|     |     |     |     | 249 | 3 | V | I | A | A | 2 | 3 | 1 |  |  |  |
|     |     |     |     | 250 | 4 | V | A | I | A | 2 | 1 | 3 |  |  |  |
|     |     |     |     | 251 | 5 | A | I | V | A | 1 | 3 | 2 |  |  |  |
|     |     |     |     | 252 | 6 | A | V | I | A | 1 | 2 | 3 |  |  |  |
|     |     |     | 3   | 253 | 1 | I | V | A | D | 1 | 2 | 3 |  |  |  |
|     | 254 |     |     | 2   | I | A | V | D | 1 | 3 | 2 |   |  |  |  |
|     | 255 |     |     | 3   | V | I | A | D | 2 | 1 | 3 |   |  |  |  |
|     | 256 |     |     | 4   | V | A | I | D | 2 | 3 | 1 |   |  |  |  |
|     | 257 |     |     | 5   | A | I | V | D | 3 | 1 | 2 |   |  |  |  |
|     | 258 |     |     | 6   | A | V | I | D | 3 | 2 | 1 |   |  |  |  |
|     | 4   |     | 259 | 1   | I | V | A | D | 1 | 3 | 2 |   |  |  |  |
|     |     |     | 260 | 2   | I | A | V | D | 1 | 2 | 3 |   |  |  |  |
|     |     |     | 261 | 3   | V | I | A | D | 3 | 1 | 2 |   |  |  |  |
|     |     |     | 262 | 4   | V | A | I | D | 3 | 2 | 1 |   |  |  |  |
|     |     |     | 263 | 5   | A | I | V | D | 2 | 1 | 3 |   |  |  |  |
|     |     |     | 264 | 6   | A | V | I | D | 2 | 3 | 1 |   |  |  |  |
|     | 5   |     | 265 | 1   | I | V | A | D | 2 | 1 | 3 |   |  |  |  |
|     |     |     | 266 | 2   | I | A | V | D | 2 | 3 | 1 |   |  |  |  |
|     |     |     | 267 | 3   | V | I | A | D | 1 | 2 | 3 |   |  |  |  |
|     |     |     | 268 | 4   | V | A | I | D | 1 | 3 | 2 |   |  |  |  |
|     |     |     | 269 | 5   | A | I | V | D | 3 | 2 | 1 |   |  |  |  |
|     |     |     | 270 | 6   | A | V | I | D | 3 | 1 | 2 |   |  |  |  |
|     | 6   | 271 | 1   | I   | V | A | D | 2 | 3 | 1 |   |   |  |  |  |
|     |     | 272 | 2   | I   | A | V | D | 2 | 1 | 3 |   |   |  |  |  |
|     |     | 273 | 3   | V   | I | A | D | 3 | 2 | 1 |   |   |  |  |  |
|     |     | 274 | 4   | V   | A | I | D | 3 | 1 | 2 |   |   |  |  |  |
|     |     | 275 | 5   | A   | I | V | D | 1 | 2 | 3 |   |   |  |  |  |
|     |     | 276 | 6   | A   | V | I | D | 1 | 3 | 2 |   |   |  |  |  |
|     | 7   | 277 | 1   | I   | V | A | D | 3 | 1 | 2 |   |   |  |  |  |
| 278 |     | 2   | I   | A   | V | D | 3 | 2 | 1 |   |   |   |  |  |  |
| 279 |     | 3   | V   | I   | A | D | 1 | 3 | 2 |   |   |   |  |  |  |
| 280 |     | 4   | V   | A   | I | D | 1 | 2 | 3 |   |   |   |  |  |  |
| 281 |     | 5   | A   | I   | V | D | 2 | 3 | 1 |   |   |   |  |  |  |

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|--|--|---|-----|---|---|---|---|---|---|---|---|--|--|--|
|  |  |   | 282 | 6 | A | V | I | D | 2 | 1 | 3 |  |  |  |
|  |  | 6 | 283 | 1 | I | V | A | D | 3 | 2 | 1 |  |  |  |
|  |  |   | 284 | 2 | I | A | V | D | 3 | 1 | 2 |  |  |  |
|  |  |   | 285 | 3 | V | I | A | D | 2 | 3 | 1 |  |  |  |
|  |  |   | 286 | 4 | V | A | I | D | 2 | 1 | 3 |  |  |  |
|  |  |   | 287 | 5 | A | I | V | D | 1 | 3 | 2 |  |  |  |
|  |  |   | 288 | 6 | A | V | I | D | 1 | 2 | 3 |  |  |  |